The Builder.

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The Egypt of the Past.

EGYPT has always been a fertile land to the historian. From the seventeenth century, when the most extravagant and absurd ideas were promulgated and blindly accepted by the reading public of that period, until the present day, which has brought forth the sound and durable works of Wilkinson and Brugsch, and Dr. Birch's numerous monographs and treatises, the bibliography of Egypt flows along in uninterrupted streams. To the list of works which are of profit and entertainment to the reader, Mr. Erasmus Wilson's "Egypt of the Past" must be added.* Though not so large as the histories of the first two writers above mentioned, and not pretending in any way to be exhaustive, this work rightly commands a place in the libraries of all who are desirous of keeping themselves *au courant* with the latest developments of thought and contemplation about the many mysteries which, in spite of all that has been said and written upon Egypt, still cling with undiminished force to the land of the Nile. Mr. Erasmus Wilson devotes his first chapter to the origin and early inhabitants of Caucasian type; Thinis, the capital of Mena; the first Pharaoh; the Osiris myth, which embodies the whole scope of moral philosophy and the eternal condition of the soul in a future world; and a summary of the events of the first dynasty, the date of which may be placed at a distance of about six thousand years from our day. The salient points of the history of this remote dynasty include not only the erection of Thinis, but the Mausoleum of Osiris at Kom-es-Sultan, the diversion of the bed of the Nile, the building of the Pyramid of Sakkarah, and the formulation of two of the principal chapters of the Ritual or the Book of the Dead. Literature at this time was not altogether unknown, for we have written evidence of the progress of research in anatomy and medicine during the reign of the successor of Mena, and the flint flakes which formed the surgeons' knives and lancets are still preserved. The late Prisse d'Avennes, one of the most accurate draughtsmen of Egyptian antiquities,—an art in which no one has excelled him but the lamented Joseph Bonomi,—found at Thebes a small case containing a few very fine flakes of silex, of the size of a fish-scale, neatly mounted on little cedar-wood handles, evidently a set of lancets. But the use of a useful article must not be held to favour, according to the author, a developmental state of man as implied by the term "stone period," when stone was his only resource, since metals must have been in use among the Egyptians at the opening of the first dynasty, and possibly much earlier. A second chapter treats of the second and third dynasties; the language of the Egyptians, once so full of difficulty and doubt, was fairly well read by many, although, strange to say, without a universally accepted system of transliteration; the pyramid and tombs of Meidoum; the worship and cult of the sacred bull; and the building of the Serapeum. Mr. Wilson's remarks on the history and development of the language are apposite and lucid, but the consideration of the matter requires a large and comprehensive treatment, which would interfere with the limits proposed by the author to his work. A good grammar of the language with reference to the Coptic and Semitic philology with which it is involved, is still a desideratum with us. All that have yet been written are crude, tentative, and imperfect. The best and most readily obtained is probably that written by M. Le Page Renouf, for Messrs. Bagster & Son, at the suggestion of the late Mr. W. R. Cooper, an ardent archæologist and lover of Egyptian history, to whom in a very great degree the foundation of the Society of Biblical Archæology, and the formation of the series of "Records of the Past," is admittedly ascribed. There is, however, no doubt that the desire of learning to read Egyptian hieroglyphics is extending among us. Perhaps some day the Universities of Oxford or Cambridge may see the propriety of stimulating this really important branch of scientific knowledge by endowing a scholarship, or even the chair of a professor with the funds necessary for this purpose. Dr. Birch's "Introduction to the Study of Egyptian Hieroglyphics," London, 1857; Chev. Bunsen's "Egypt's Place," London, 1848-1867; M. de Rougé's "Christomathie Égyptienne," Paris, 1867; Brugsch-Bey's "Hieroglyphische Grammatik," Leipzig, 1872; the "Grammaire Démotique," published at Berlin in 1855; and many other works on this language, would enable any competent scholar, with sufficient leisure at command, to master the difficulties of the language in a comparatively short space of time, an acquaintance with the cognate languages not being really so imperative as might be supposed.

Of the builders of the Pyramids, and of the Sphinx, and the obelisk worship of the fourth dynasty, to which Mariette attributes the date of 4235 B.C., and Lepsius 3122 B.C., while Wilkinson is content with the assignment of the less distance of 2,450 years before the Christian era,—the author has much to say. A succeeding chapter relates the principal events from the fifth to the eleventh dynasty, say from 3951 B.C. to 3064 B.C., if we accept the furthest position assigned by Egyptian chronologists, or from 2240 B.C. to 2080 B.C. if we accept the more moderate theories of Sir Gardner Wilkinson. The history of those early dynasties is obscure: of their remains the chief are the pyramid of Unas, the tombs of Thi and Ptah-hotep, the pyramids of Meri-ra-pepi and Meren-ra, the city of Zan or Tanis, the family of Antef, and the expedition to the land of Punt, or "the South," in the reign of Sankhara, the fifty-eighth monarch of the Royal Fasti commemorated in the Tablet of Abydos. The productiveness of the black soil of Egypt, we are told, annually enriched by the inundations of the Nile, has become proverbial. By the expenditure of very little labour, always a cheap commodity in Egypt, the population was supplied with everything necessary for food and raiment, but luxury and refinement clamoured for more. Caravans of Arab traders made regular journeys between the Nile and the South, and returned laden with spices, perfumes, balsams, frankincense, and precious woods. The South was the "Ophir" and the "Punt," or "Pount," of the Egyptians, and its produce was sought after most eagerly. Punt was a generic name for the whole southern region; it lay to the south of Abyssinia, between Bab-el-Mandeb and Cape Guardafum, and at a later period embraced the opposite coast of Arabia. Brugsch, whose authority and statements have been very generally accepted throughout this work, mentions an obscure tradition that Punt was the original home of the gods, the Ta-neter, or "Holy Land," whence the Theban triad of Amen, Maut, and Khons, the father, mother, and son, travelled to the Valley of the Nile, and there laid the foundation of the Egyptian empire. On the coast of the Delta, which, at this remote period, was in all probability a very swampy district, densely overgrown with the low vegetation usually occurring in the warm marshes of tropical latitudes, and which was first brought under cultivation in the vicinity of This or Thinis, and Memphis, the towns of Tanis and Heracleopolis Parva had been founded by Semitic wanderers over the sea. These colonists gradually penetrated into the interior country, and there came into collision with the Egyptians coming from the north, and adopted their culture and their manners. At the same time, however, it is recorded by the talented but anonymous author of Baedeker's "Egypt," they retained their independence under kings of their own, who, during the period of the sixth, seventh, and eighth Egyptian dynasties, form the ninth and tenth contemporaneous dynasties of the Heracleopolites who, from the year 2691 B.C. onwards, ruled over the Delta, and perhaps also the whole of Lower Egypt. The eleventh dynasty, which closed the sway of the Heracleopolites, was not esteemed by the Egyptians as a strictly legitimate line.

The twelfth dynasty finds Egypt still in an unsettled state. Amenemhat I., the founder of the line, builds a wall along the eastern frontier

* "The Egypt of the Past." By Erasmus Wilson, F.R.S., Author of "Cleopatra's Needle, with Brief Notes on Egypt and Egyptian Obelisks." With forty-six illustrations. London: Kegan Paul, Trench, & Co. 1881, 8vo.

of the Delta, to oppose the invasions of the Asiatic races, and founds the temple of Karnak, so well known to us from all illustrated works on Egypt. Subsequent monarchs add to the fortresses, temples, and public buildings, which, as in their magnificent desolation, so, too, in their monumental teaching, still form a prominent feature of the country. One of the principal political events in this age is the regulation of the traffic between Egypt and Central Africa by Usertesen III., or "the Great," to whom, in recognition of his meritorious and memorable reign, Thothmes the Great subsequently erected a memorial temple, that his name might be remembered with as much sanctity in Nubia as that of Snefru or Senneferu, of the third dynasty, was in the valleys of Sinai. The space at command on this occasion does not allow us to say much of the "Hyksos" or shepherd kings, the exponents of the political power of the shepherd colonists, whose power was first felt in Egypt in the fourteenth dynasty, although they had entered the country long before as Semitic immigrants during the twelfth dynasty, upwards of 2,000 years before the Christian era. These newcomers, meeting with kindred spirits among the seaports of the Delta, and allying themselves with these and warlike Arabian tribes, at length became powerful enough to defeat the standing armies of the Pharaohs and obtain possession of the whole of Lower Egypt. Three dynasties belong to the victorious Hyksos: the fifteenth to the seventeenth; but they ruled during the fourteenth also, through the nominal reign of the Xoite kings. They applied the name of the Egyptian god Set to their own gods (Be'alim); and the andro-sphinxes yet preserved at Tanis with the portrait-heads of their monarchs prove that they employed Egyptian artists in their service. Perhaps, too, they themselves acquired a knowledge of Egyptian plastic arts. It is at the close of the Hyksos period that Abraham and Joseph arrive in Egypt, just before the success of the war of independence, the overthrow of the dynasty, and the erection of the new empire by Aahmes, who, succeeded by a long line of Thothmes I.-IV., and Amenhotep I.-IV. gives the crowning point of culmination to the imperial system of "Egypt of the Past." The foreign campaigns, extensive religious changes, numerous architectural erections, and enlargement of the boundaries of government which occur during this period are well described and carefully explained by Mr. Wilson, who has never failed to utilise throughout his book the newest evidences and the latest information which has been brought to light and accepted concerning the ancient history of Egypt. Of the nineteenth dynasty, made famous by the names of Rameses I. and II., and Seti or Sethos I.; of the twentieth, equally illustrious for its third Rameses, and succeeding monarchs of the same name, much is related, but we must refer the reader to the pleasant and instructive pages and careful illustrations of the book under notice if he would acquire a large fund of accurate information which has been herein sifted and condensed in a way which is both creditable to the author and thankfully acceptable to those who cannot spare the time to go through more prolix narratives of those times. Rameses III., the most splendid and wealthiest of the Pharaohs, won most of the treasures that he applied to the immense works of the Memnonium, the temples of Memphis and Heliopolis, and that dedicated to the god Khunsu at Karnac, from the foreign enemies who fell beneath his yoke. Part also he derived from mines, quarries, and commercial enterprises; for his fleets, like those of the Royal Lady Pharaoh Hatasu (the Elizabeth of Egyptian history, if we may compare English with Egyptian dynasties), brought spices and rarities from the rich shores of the Indian Ocean. For thirty-two years he filled the throne of Egypt, and devoted the last part of his life, which was broken by no great wars, to the domestic welfare of the valley of the Nile, which under his orders was planted with shady trees,—a deed which won for him perpetual gratitude. The fame of his wealth has, however, outlasted that of his achievements; and it was the superabundance of his riches which alienated him and his children from the severe simplicity of an earlier time. He lived, says Ebers, surrounded by a harem, in whose pestilent soil conspiracies were constantly fostered, to which he was nearly falling a sacrifice, and he ended his days as the mere tool of the priests, enervated and enfeebled, and scorned by his contemporaries, after sharing sovereignty with his son.

The concluding chapters of Egyptian history, as told by Mr. Wilson, who brings his book down to the close of the thirty-first, or second Persian dynasty, present to us the usual picture of imperial and national decadence. The growing power of Assyria had absorbed the kingdom, which had already fallen a prey to the Ethiopians. Psammetichus, with a league of twelve governors, and aided by Greeks and Carians, threw off the Asiatic yoke. A short period of revival ensued, but finally, under the Roman emperors, Thebes, the ancient capital of the mightiest sovereigns of the world, at length reduced to the condition of a provincial city, witnessed strange and unwonted changes of fortune. Many of the rock-tombs became the cells of recluses, many venerable monuments and noble portrait-statues were reduced to ruin on the ground of being the work of the heathen, and many temple-halls transformed into Christian churches. Much in the same way, the pious abbot of St. Alban's destroyed the Celtic literature which he found in buried chambers on the site of the ancient city of Verulam, and the evangelising pioneers of the Roman Christian church utilised the edifices dedicated to the gods of Rome, which they found ready to suit their purpose in many a city of Britannia. Many of the existing Egyptian architectural and historical remains will soon be hopelessly destroyed; shepherds feed their flocks where palaces once reared their imposing masses, and the inhabitants of the remoter villages, that have sprung up amid the ruined magnificence of bygone centuries, have so little respect for the remains of an antiquity whose teachings they cannot grasp, that they burn the finest fragments in their lime-kilns, cut up statues, pillars, and columns into mill-stones, build wretched huts with the finely-hewn blocks, and even chip the carved stones into small pieces in the vain hope of finding a forgotten or a hidden treasure. To the student, as well as to the ordinary reader, no small gain will accrue from a perusal of Mr. Wilson's work, which partakes of the character of a synoptical view of the history, language, and literature of Egypt, at the same time that it is full of suggestions which may lead some among us to view Egyptian relics in newer lights, and in ways that we have hitherto failed to adopt. The illustrations, both coloured and drawn on wood, are well done; they are fairly representative of the principal remains, and to a work which aims at being popular rather than abstrusely profound, they are indispensable. Its moderate size contrasts well with larger volumes, but for all this, little that is of importance to be said will be found to have been omitted. The lists of dynasties and the explanations of hieroglyphic characters will be found useful for reference and comparison with the detailed records in the body of the work. Mr. Wilson, in his preface, alludes to the newest discovery of twenty royal mummies in a subterranean excavation in the Western Mountain, opposite Thebes, and hints at the possible incorporation of their history into a second edition of his book. We can only trust that he will be enabled to carry this proposition into effect with as little delay as possible.

DIAMONDS AND PRECIOUS STONES.

There are few persons, even among those who are not the possessors of diamonds or others of the higher class of precious stones, who would not be conscious of the interest attaching to the subject. It is not merely that the objects treated of are in themselves very beautiful in texture and colour, but that they are surrounded by such attractive associations. They have formed the adornments of beauty and the appendages of luxury and power and magnificence in all ages. On the title-page of the work *à propos* of which we offer some remarks on the subject,* the very words,—"Diamant et pierres précieuses: bijoux, joyaux, et orfèvreries," seem to glitter on the paper. All the associations with the subject are courtly and sumptuous, so much so that Thackeray's satirical story of the "Great Hoggarty Diamond" seems a debasement of the great gem to the playing of a part quite below its proper associations.

A distinction may be drawn between those precious stones which are found in a more or less regularly-crystallised form, and those which do not crystallise and are found in irregular forms. The list of crystallised stones is, of course, headed by the diamond, which in its natural state is usually found either in cubes or in forms closely related to cubes, and formed, as it were, by the paring off of the angles of the parallelogram. The ruby and topaz belong also to the order of crystalline stones, which take mostly the form of six-sided prisms, either with parallel sides, or diminishing to a point at either extremity like two hexagonal cones placed base to base. The emerald and beryl also crystallise in hexagons, but with small diagonal facets at the angles. The sapphire is a crystal of six sides, two long sides opposite to each other, a long hexagonal prism. The topaz crystallises rather variously, most often in eight faces. The quartz, of which there are several varieties under what may be called specific names, such as amethyst, false topaz, &c., forms hexagon crystals with or without pointed ends. The turquoise, one of the most beautiful in colour of all the precious stones, is never found crystallised, but always in comparatively smooth, rounded forms showing a different type of origin from the crystallised stones. Almost the only other substances of value that do not occur in crystallised forms are pearls and corals, and these, of course, are formed under different circumstances from purely mineral stones, and belong to a different class.

A considerable portion of the first part of the treatise before us is occupied with considerations as to the various prismatic forms which can be artificially produced from the natural prismatic forms assumed by diamonds and other stones, and the theoretical and practical means of defining and proportioning them. There is also a good deal of information in regard to the various tests which may be applied to ascertain the genuine character and the degree of purity of crystallised stones. In regard to the relative hardness of various stones, this is naturally determined by the power of one stone to make scratches on another. If a diamond is scratched with one of the points of a crystallised topaz, the topaz point is blunted, and the mark which will be seen on the face of the diamond is only the dust of the topaz, which can be brushed off with the finger. But if the topaz is scratched with the diamond, the latter is unaltered, and the surface of the former is marked by a striation which can only be removed by further polishing down. It is on the base of this process of comparison that a kind of scale of comparative hardness has been formed represented by ten substances, of which diamond is the highest and graphite the lowest in the scale. It is a curious indication of the immense importance of chemical conditions of combination in determining the outward aspect of a substance, that these two extremes of the scale, the brilliant and hard diamond and the soft black graphite, are both chemically the same substance,—pure carbon.

The most valuable diamonds are those which are entirely colourless. Those with a blue tinge, though still more rare, are not so highly valued, as the actual beauty of the pure ones outweighs the rarity of the blue variety. One of the finest of the blue variety is, we believe, in the collection of Mr. Beresford Hope. Diamonds of a red tinge take still a good place; green diamonds are tolerably numerous, and rank lower; yellow ones are very common, and the least esteemed. The estimation of the value of a diamond is made according to a regular system of appraisement, for an account of which we refer the reader to the book, merely mentioning that it will surprise many of those who are not conversant with the subject to learn what a large proportion of a diamond is often ground away to dust in cutting it so as to make the most of its brilliancy. The greatest diamond in the French Treasury, the Regent, weighed, we are told, 410 carats before cutting, and 136½ after cutting, which seems an immense loss in size; but we presume it really increased the marketable value of the gem. Of course, the diamond dust taken off in cutting is not allowed to be lost, but it is useful chiefly for practical purposes, in forming in its turn the means of grinding down the faces of other diamonds, for this superb stone will yield to no tool but one made from its own substance.

The brief history, with the portraits of some of the great diamonds of the world, makes an interesting chapter in the work, and one cannot but be strangely struck with the extraordinary

* Diamant et Pierres Précieuses: bijoux, joyaux, orfèvreries, au point de vue de leur Histoire et de leur Travail. Par Ed. Jannettaz, E. Fontenay, Em. Vanderheym, et A. Coutance. Deuxième Edition. Paris: J. Rothschild. 1881.

importance attached to these small pieces of crystallised carbon, some of which have been the subject of diplomatic negotiations, and of even worse forms of fighting. According to the authors, the Regent, before mentioned, is admitted to be the most remarkable diamond in the world; but this may be national prejudice. It has had a remarkable history, and was at one time stolen and entirely lost, as was supposed; and on another later occasion was pledged by the French Government to a German banker in respect of a loan. Our own Koh-i-noor is ranked next; and there is a partial history and a drawing given of a mysterious diamond, the Mogul, which was in the treasury of Aurungzebe in the seventeenth century, but which has disappeared, unless, as some persons think, it is identical with the Koh-i-noor.

Those who are interested in learning to what processes the diamond is subjected to bring it to its best form will find some information on these points given, with one or two illustrations of the operators at work, which are, however, rather too small to show the *modus operandi* very clearly. It is, though, sufficiently described. The three principal operations are cleavage: then what our French authors call *brutage*, which is a rough formation of the shape previously to its being finished by the cutter, whose work forms the final stage. The cleavage is done when the diamond is not of a good shape originally, or has faults and imperfections which can advantageously be cut away. The work is carried on with a cutting diamond inserted by means of cement in a copper matrix at the end of a short stick, the diamond to be cut being inserted in a similar stick; thus a sufficient leverage is obtained, and an incision is made in the diamond to be operated upon, in one of its natural lines of cleavage (the direction of which is deduced from the angles of crystallisation), and it can then be split along this line of cleavage with a knife and a hammer. If the diamond is naturally found in a good shape for working upon, and free from blemish, there is no need for cleavage; but the *brutage* or rough-shaping is the only stage before the final cutting and polishing. The rough shaping is carried on by two diamonds worked upon each other, also carried at the ends of sticks as in cleavage, but of shorter and stronger ones, as the diamond has to be shaped by mere force in rubbing and beating one against the other, and requires the exercise of considerable strength. In both cases the operator must be very well acquainted with the habits of crystallisation of the diamond, and the rough-shaper, of course, really decides its ultimate form, the work of the cutter being really rather polishing than cutting. The polishing is done on a wheel served with diamond-powder in very fine olive oil. The powder comes from the cleavers and shapers, the former of whom wear leather aprons, one side fastened round their waists and the other side to the edge of the table at which they work, so that all minute fragments may be collected.

The latter part of the work is occupied with remarks upon jewelry and goldsmiths' work generally, with illustrations; considering the subject from an artistic point of view. In this light, however, this part of the subject is not treated so exhaustively as to call for any special consideration in our columns, where so much has been said on the subject of artistic workmanship; and our language is rich in books on this part of the subject. The special interest of the book we have been speaking of lies in the thorough statement which it gives of the qualities of the diamond and other precious stones, and of the theory and practice of working them. In regard to this, which is its main object, the work displays that logical treatment of the subject *ab initio* which is such a praiseworthy characteristic of French technical publications generally. This is the prosaic side of the subject certainly; and some persons, especially of the sex whose privilege it is to be decked with these beautiful quintessences of colour and light, may think they would rather contemplate the beauty of the finished object than follow its history into the workshop. But they must not forget, in admiring the jewels with which they set off their own beauty, that there is a moral in connexion with them. It is given in a concentrated form by Herrick, in a little poem wherein he cautions some fair "Julia" or other against being proud of her beauty and of her sparkling eyes:—

> "Whence that ruby which you wear
> Sunk from the tip of your soft ear,
> Will last to be a precious stone
> When all your world of beauty 's gone."

STRAWBERRY LEAVES AND BLACK DIAMONDS.

The coronet of an English Marquess, as many of our readers are aware, is a golden circlet, on which four pearls are interposed between as many golden strawberry leaves. The rank in the peerage is marked by several characteristics. Originally the President of the Marches,—there was a *Marquis de Septimanie* in Carlovingian times,—the distinctions which now attach to the title in England, of "Prince," and "Most Noble," are those of the eldest son of a Duke, to the heir of which, as originally a sovereign title, the above dignities apply. And some English Marquesses, as Lord Londonderry, with 60,000 acres of landed property, and Lord Bute, with 116,000 acres, may well look down on many a German or Italian Duke.

It is of the first of these magnates that we now have to speak, as having added,—shall we say, a new lustre to his coronet?—at all events, as replacing the ancestral pearls by black diamonds. In other words, Lord Londonderry has added to his rank, wealth, and illustrious descent the rare novelty of becoming a retail coal dealer. The expression may raise a smile, but we are by no means sure that it may not be a smile of that agreeable kind which is permitted to those who win. At all events, Lord Londonderry is now doing what many persons who are inconvenienced by the magnitude of their coal bills have long begged and prayed some great coal-owner to do,—selling his own coal retail in London. We have before us a note from the wharf, St. John's Wharf, Millbank, on which what is intended for the coronet of a Marquess, is duly stamped,—*apropos* of which we recommend those whom it may concern to have a correct drawing substituted for what we can only call a diagram. Joking apart, if the Marquess of Londonderry shows that by fair and open dealing he can afford to reduce the price of Wallsend coal to the Londoner by 15½ per cent., there will be many persons of opinion that he has added a new lustre to his coronet by so doing. We observe that on the day on which the price of 22s. a ton for Newcastle coal, delivered within four miles of the Wharf at Millbank, is quoted by the agents of the Marquess, six of the most respectable firms in the London coal trade advertise best Wallsend coal at 26s. In the same paper, however, there is an advertisement of apparently the same quality of coal on sale by a proprietary company at 18s. a ton. We do not affect to be in a position to advise our readers on the subject, further than to hint that it will be well for them to put the question to the test. It has long been matter of doubt and debate how it was that the price of coal at the pit's mouth was quintupled or sextupled by the time the mineral was put on our fires in London. Very much has been said as to a coal "ring." The truth of this will now be put to the test. The quality of coal has to be considered in the first place. We apprehend that there is no better than that which the Marquess of Londonderry can supply; but here we await the opinion of the expert.

There are several kinds of "Wallsend" coal, and the size of the "double-screened" coal, as delivered to the householder, is an element of value. The expenses and risks of delivery are large, and the temptation to the individual dealer to cut in and undersell a ring, if such there be, and if they keep up a fictitious price, is great. Therefore, it will be a metropolitan benefit to have this matter set at rest, as it is likely now to be. If Lord Londonderry can send into our cellars, within four miles of Millbank, the best Newcastle coal at 22s. a ton, there is no doubt that the merchants will have to come down to that price. We speak with due reserve, knowing that there is a difference between the beginning and the end of any new enterprise. But the usual elements of failure seem absent in this case. There is no needy urgency, no want of capital, no want of thorough practical knowledge of the case, no want of command of the mineral to be sold. Under these circumstances, the difference between 26s. and 22s. a ton is worthy of very serious attention. If Lord Londonderry can permanently bring down the price of coal in London by the simple and legitimate mode of dispensing with intermediate agency between the pit in the North and the edge of the wharf on the Thames, he will be better deserving of a statue than some persons who have been or are to be gratified by that mark of the gratitude of their contemporaries.

THE TRANSACTIONS OF THE INSTITUTE OF ARCHITECTS.

If we felt some doubt, during the progress of last session of the Institute, as to the advisability of spending so much in printing for immediate use incomplete abstracts of the papers read, we have no doubt whatever as to the advantage of issuing the whole Transactions of the session in a volume like that now before us. When the papers were issued in their complete form during the progress of the session they were necessarily hurried in regard to revision, and, coming out in this pamphlet form, we should surmise that their natural fate often was to be thrown aside until the volume was complete for binding, and very possibly never looked at again. Coming to the subscribers in the complete form in which the present volume comes, printed on excellent paper, and supplied with admirable and carefully-drawn illustrations, the Transactions certainly assume a more attractive form than they have ever assumed before. The only drawback lies in the absolute necessity of printing a certain amount of the matter twice over, in order to supply the immediate report of the paper necessary as a basis for the discussions. It becomes, however, in this light, simply a question of funds. If the Institute can afford it, the result seems to us quite worth the extra trouble, when we consider it as a means of representing adequately what has been done during the session. In this respect the matter seems to concern not only members of the Institute, but also the manner in which the doings of that body are presented to the outer world. We hope that, notwithstanding the semi-private form of publication to which the Transactions of a society are limited, it will be thought worth while to give to a large section of the public press an opportunity of forming and expressing an opinion upon the merits of this year-book of the central architectural institution of the kingdom, and of the result we should feel no doubt. We say this without partiality, having by no means always supported the action of the Institute, or the manner in which their Transactions were got up; but we feel sure that no cultivated and impartial reader could take up this volume without being struck by the varied interest of its subjects,—artistic, archæological, and practical,—and the very thorough manner in which they have been gone into. So little seems generally known in the ex-architectural world as to the work the Institute of Architects is really doing,—the reports in the daily papers being generally of the most meagre description,—that we imagine many non-professional readers would be considerably surprised to find so important a volume as this issued as the result of one year's deliberations.

As a practical book of reference on several important subjects, this volume has something like a permanent value. We find, first, the very important subject of barrack-planning and construction, treated by Mr. Ingress Bell, both historically and practically, and with typical plans of what has been done in past and in modern days. One of these plans of an old barrack, that in the Savoy neighbourhood, has a value in itself, as it is a hitherto unpublished plan of an old and interesting corner of London in its former state. The plans of the typical modern English barrack are in most respects good model plans, though we are unable to understand why it should be supposed that only with the officials of the War Office could such plans have been matured; and we quite concur in the remarks made in the course of the discussion in regard to the conduct of the Government in selecting a plan out of a competition as the best plan for cavalry barracks, and then taking the planning into their own hands, and leaving the architect with the privilege of putting the outside shell to it. This illustrates only too well the average Government idea about architecture in this country; but in any case the essay, with its illustrations, forms a useful contribution to the literature of the subject. We may point out one defect in the plan given of married soldiers' quarters in connexion with brigade depôt barracks; all these are residences with one small bedroom only. It may be presumed that married soldiers, like other people, will have children; indeed, as there is a schoolroom provided in connexion with the block, it would appear that the War Office has contemplated this contingency. It is not desirable that there should be only one bedroom for parents and

children after the latter have passed infancy, and the going back to this arrangement in Government barracks is to be deprecated. If considerations of space render an extra room impossible, the solution would be found in providing a turn-up bed for the children in the living-room, to be let down at night. But there is no evidence that the authorities have considered the subject at all.

Another practical subject of far more general interest at present, that of electric lighting, is illustrated both with pen and pencil in the paper read by Mr. Slater, and which will be found to be a very clear and useful *resumé* of the state of the matter at present, as affecting the great public question of artificial lighting for everyday use; and the diagrams accompanying it, and illustrating one or two of the leading systems, are very well executed, and add much to the usefulness and interest of the paper. On the matter of Quantities, which formed the subject of another lengthened paper and discussion during the session, we have previously expressed our mind. The subject is chiefly of interest to professional men only; they will find in this volume most of the arguments for and against the undertaking of quantity-surveying by the architect very fully given, and, like the artist whose colours were mixed for him, and who "had nothing to do but shove 'em on," the reader of the Quantities paper and discussion will have nothing to do but read the arguments which are all prepared for him, and then make up his mind which is the best. Last, but by no means least, among the practical papers we have the very full and able one by Mr. E. C. Robins, which in its full form as given here is a much larger and more elaborate essay than either was or could have been actually read at the meeting; and though in general we should not approve of the system of publishing in Transaction volumes what was not really said at the meeting, there is a reasonable excuse for it in this case, in consideration of the very great importance of giving a general summing up of the subject. In this respect we have no hesitation in saying that this volume of the Transactions is worth possessing, if only on account of the paper and discussion on this subject of sanitary science. Those interested in the subject will find there an admirable all-round view of it by an architect who has given much thought to it, and a discussion embodying the views *pro* and *con.* of a number of gentlemen, nearly all of whom had acquired a special right to speak on the subject; for in this respect the discussion was a very well-ordered one, and there was very little indeed of the mere talking for the sake of talking, which it is usually very difficult to keep out of such discussions.

In the archæological department of the Transactions the most important subject is the Roman villa at Brading, of which, we are glad to see, the Institute have been able to publish some very good illustrations, including coloured lithographs of some parts of the mosaic floor designs. The other archæological paper, by Mr. Stevenson, bearing the title, "Historical Documents," has less practical usefulness. The writer of it, in common with others of the party to which he belongs, seems unwilling to see two sides of a question; and because every relic of an old building and record of an old custom is interesting, as it unquestionably is, he puts aside the fact that there are at times still more important considerations bearing on the requirements of the present day, and that the due fulfilment of these may not be compatible with the preservation of every morsel of old brick or stone merely because it is old. The paper was the occasion of a smart and somewhat unkind retort by Sir Edmund Beckett, who, however, certainly had the best of the argument in a common-sense point of view.

The paper which was read upon Persian architecture and construction, written but not read by Mr. Purdon Clarke and Mr. Hayter Lewis, is, we are glad to see, also supplied with illustrations of the general plan of the style of building referred to, and of the diagrams of the typical form of fretted roofing belonging more or less to all styles connected with or influenced by Arabian architecture. The paper would, perhaps, have been better named "Modern Persian Architecture," or "Persian House Architecture," as this is the part of the subject it more especially illustrates. As Mr. Fergusson remarked in the discussion, to propose to treat "Persian Architecture" as a whole in a single evening's paper would be to seem ignorant of the great extent and intricacy of the subject.

In conclusion, we may observe that the result quite bears out the correctness of the views of the present management of the Institute in regard to diminishing by nearly one-half the number of subjects to be treated of during the progress of a session, and setting apart a separate evening for the full discussion of each subject. To obtain fourteen or fifteen good papers in one session, such as shall really show thought and consideration, and be practically suggestive, is next to an impossibility, as every secretary who is in earnest in his business has found to his cost. Hence, in such a case comes the almost absolute necessity of filling up with mere perfunctory papers, which are read to oblige the secretary, or because the reader of them wishes to bring himself into notice. The reduction of the number of papers makes it much more possible to secure really good ones; and we have here a volume of which we may say that nearly all the contents are worth considerate reading. We may assume that some part at least of the successful result is due to the assiduity and intelligence of the secretary, Mr. William H. White, in whom the Institute have found the right man in the right place.

STEAM LOCOMOTION FOR STREET TRAMWAYS.

Under the auspices of the Liverpool Tramways Company and of the Corporation of Liverpool, some trials are about to take place in that city to test the capabilities of tramway locomotives. One of the locomotives that will compete,—that made under Matthews's patent,—we had an opportunity of seeing last week at the works of Mr. F. W. Jackson, Kingsbury-road, Ball's-pond, favourably known to some of our readers as a manufacturer of builders' plant and machinery. Mr. Matthews's engine is in all essential particulars a miniature railway locomotive, weighing about five tons, but combining certain modifications to meet the exigencies of street tramway traffic and the requirements of the Board of Trade. The successful application of steam locomotion to street tramways, under the conditions and restrictions to which we refer, has been an exceedingly difficult problem to solve, if, indeed, a solution has yet been arrived at. Upon this point, the Liverpool trial may afford some evidence. For our own part, we are bound to confess we look rather to electric power than that of steam to remove existing difficulties, but that may not be yet. To conform with a condition imposed by the Board of Trade, all working parts of the engine are encased so as to prevent the frightening of horses. To meet this particular requirement, it would only be necessary to enclose the working parts on the outside, but the mud and dust of street traffic render it desirable that the cylinders, pistons, cranks, &c., should be completely encased, and this is effected in Mr. Matthews's engine, in which the whole of the driving machinery is arranged on the outside of the frame-plates, and enclosed in a close casing. The engine can be driven from either end,—a necessary provision for all tramway engines which do not travel continuously on circular routes, but which need reversing at the end of each journey. It is one of the conditions of the Board of Trade that the driver of the engine must be right in front, so that he may keep a thorough look-out, and have perfect command of the machine. In the engine which we are describing the boiler is of the locomotive type, working, however, with a pressure of 150 lb. of steam to the square inch. The water is carried in side tanks, in which is placed a patent condenser for the exhaust steam, the tanks being connected by a pipe. Smoke is prevented by the use of smokeless fuel. The regulator and reversing levers are placed at each end of the engine, and at each end there is a powerful brake to be operated by the driver's foot. The engine is covered by a roof, and the boiler is enclosed with a casing, the upper part of which is fitted with sliding glass panels or windows. The total height is about the same as that of a passenger tram-car. The fire-box is necessarily at one end only of the engine, and as it is not proposed to employ a stoker in addition to a driver, it is obvious that the driver can only be near the stoke-hole when the engine is travelling in one direction, and, indeed, even when he is driving from the firebox end of the engine, he will hardly be able to bestow any attention on the fire. Under these circumstances, arrangements are made whereby the fire, being made up before the commencement of each run of four or five miles, will need no further attention until that run is completed. Other conditions imposed by the Board of Trade, and which Mr. Matthews believes he has satisfactorily complied with, are: that there shall be no steam or smoke given off by the locomotive; that there shall be no noise like that caused by the blast of a railway locomotive or a steam road-roller; that the engine shall be provided with a steam brake capable of bringing it up, when going at full speed, in its own length; that the wheels of the car which is being hauled shall also be fitted with steam brakes, acting, of course, simultaneously with those on the engine; and that where the speed exceeds eight miles an hour the steam brakes are to come into action automatically. Nearly all the working parts, such as cylinders, piston, cranks, wheels, and axles, are of steel, and the workmanship appears to be excellent. In the design of the engine, special attention has been brought to bear on the combination of simplicity and convenience, the working parts being as few and simple as possible, with the view of securing thorough efficiency and economy of maintenance. The cost of this locomotive, we understand, is about 500*l.*

THE SANITARY CONGRESS AT VIENNA.

The meetings of the *Deutscher Verein für öffentliche Gesundheitspflege* and the *Verein für Gesundheitstechnik* have this year been held at Vienna, and were convened for the same time, in order that each might in some measure profit by the deliberations of the other, and that subjects of interest to both associations might be treated in joint discussions. From their titles it will be seen that the first named (and more important) society has for its object the practical application of sanitary measures, while the latter deals with the technicalities of hygienic science.

Associations dealing with sanitary matters abroad would seem to have originated from older societies of a more strictly medical character, the importance which sanitary reform has acquired during late years as a social question having led to the bodies which were at one time branches of the societies to which reference has been made becoming independent associations. The choice of Vienna was not inappropriate as the seat of this year's deliberations, the Austrian capital having lately given much attention to sanitary matters; and the attendance of representatives from all parts of Germany was evidently by no means lessened on account of the Congress meeting in a neighbouring State. The municipal bodies of Munich, Königsberg, Breslau, Halberstadt, Berlin, and Dantzic were represented; the last-named city by Herr von Winter, under whose energetic administration the recent important improvements in drainage were carried out. The Prussian Ministry of Public Works, The Hamburg Medical Board, and the Universities of Leipsic, Königsberg, and Pesth also sent delegates, and amongst the guests were also Herr Lammers and Herr Lorent, the celebrated hygienists from Bremen, and Mr. Lindley, jun., chief engineer of the Frankfürt Sewerage Works.

The preliminary social meeting which is customary on such occasions in Germany, took place at the rooms of the Musical Association, and friendly greetings were exchanged by the various members of the Congress, amongst whom the presence of Herr von Pettenkofer (the founder of the present system of sanitary engineering in Germany), was noticed with special pleasure by his friends.

The President of the Congress was Duke Charles Theodore of Bavaria, himself a medical man, and in his somewhat arduous duties in the three days' meetings, he seems to have been successful in pleasing all parties. His opening address referred to the importance of practical sanitary measures, and to the past activity of the Society in dealing with them, though encountering the opposition of old prejudices and customs.

The central committee was formed of representatives of both societies, and after the municipal and other notable personages present had addressed the assembly, the separate Associations commenced their meetings.

Taking first the proceedings of the Society for Public Sanitary Measures, we find that

a paper on "The Hygienic Requirements of the Situation and Use of Cemeteries" was read by Professor Hofmann, of Leipsic, who expressed his opinion that the injurious effects of burying-grounds when near dwelling-houses had, as a rule, been exaggerated; and that any development of carbonic acid in graves of a certain depth was equally liable to occur in excavations for wells or other purposes. He considered that the custom of burying many in one grave was reprehensible, maintaining that where separate graves of 3½ square yards surface measurement, and of 1¼ yard depth were practicable, no danger could be experienced by adjacent dwelling-houses, provided that the situation were rightly chosen and a due order of interment observed. He referred to chemical analyses and statistics of mortality, as refuting the suggestion of infection arising, or of wells being contaminated, from the proximity of churchyards to habitations. He dwelt on the necessity of choosing a dry soil, and a situation free from chances of inundation, as an excessive quantity of water caused a more rapid decomposition to take the place of the natural slow and equable oxidation of organic substances. As a normal rule he suggested that 11 yards was a sufficient minimum distance for dwelling-houses to be situated from a cemetery. Dr. Siegel, of Leipsic, confirmed the statements of his fellow-townsman, and as to the time which should elapse between interments he suggested ten years for adult graves and five years for children's, provided that the site of the cemetery had been suitably chosen, and that the final decision on such a question rested with competent authorities. After twenty years' cessation of interments, he considered that building over a burying-ground was allowable,—of course, after removal of any coffins or of any human remains. In the discussion which followed, the importance of the subject was fully recognised, but the views of the readers of the papers were in some cases dissented from.

The second day's proceedings dealt with the general subject of drainage, and more particularly with the question whether the system of main channels caused the generation of noxious gases, and the consequent spread of infectious diseases. Reference was made to the discussions which have often taken place in English professional circles on this subject, and to the efforts made by the more exact German school of hygienists to arrive at a solution of the problem. Dr. Soyka recorded the facts at which he had arrived by means of experiments made in the hygienic laboratory of Von Pettenkofer. He made a vigorous attack upon the opponents of the modern system, and remarked that in his report on the outbreak of typhus at Croydon, Dr. Buchanan had neglected certain important factors in forming his opinion, and that certain results were really accidental, instead of being consequent on the system of drainage. He then alluded to the improved health of Hamburg, Frankfürt, and Dantzic, since the modern plan of drainage had been adopted. The city of Munich afforded him elements for some interesting arguments. That city has 321 streets without any drainage, seventy-seven with old *cloacæ*, while only thirty-five have sewers of modern construction. The mortality from diphtheria was highest in the undrained streets. As to typhus (which is known in common with diphtheria to be most prevalent in low-lying situations) the mortality in parts of the city recently drained was less in the epidemic of 1875 than in the previous one; and the reduction of mortality was greater in the low-lying streets than in those at a higher level. Dr. Soyka cited these instances as affording a potent argument against those who blame the modern system of drainage for certain epidemics of infectious diseases.

In his address on the same topic Dr. Von Roszahegyi, of Pesth, confirmed the statements of his colleague, and remarked that his own practical experiments at Munich and Frankfürt had led him to the conclusion that the air in drains is carried forward with the stream, and follows the descent of the sewer, while currents of air in a contrary direction are unfrequent and limited in extent. He considered that no perceptible influence is exercised by wind or by the temperature of the exterior air. After some remarks from Herr Von Pettenkofer and Mr. Lindley, Dr. Lissauer, of Dantzic, fully confirmed the preceding speaker's remarks about the direction in which sewer air is carried. There had been cases, he admitted, of defects in pipes (capable of being easily remedied) having admitted sewer-gas into houses, but he maintained that where cases of illness had occurred they had been caused by a want of resisting power against some prevailing epidemic, and not from direct infection. He, however, quite admitted the necessity of keeping sewer-gas out of houses, and went into some details as to the most suitable preventive appliances. The result of the discussion was highly gratifying to the delegates of such capitals as have seen the sanitary and economic advantages of the modern system of drainage, and have not hesitated to make the pecuniary sacrifices necessary in the interests of the public health.

The other society did not enjoy such a large share of public favour in its first two days' sitting, but the more limited scope of its operations readily accounts for this fact. Amongst the matters treated were "The Principles of Systematic Drainage as applied to Cities," and kindred subjects. Some interesting details were also given as to the progress made so far in the preparations for next year's Hygienic Exhibition at Berlin.

For the concluding day's proceedings both the societies were again united, the subject for discussion being "The Advantages and Disadvantages of Heating by Air," a topic interesting from a theoretical as well as from a practical point of view. The first address was by Dr. Märklin, of Wiesbaden, the president of the larger society, who spoke in favour of the present system of heating by air as being economical, and with proper management, free from any inconvenience in use. Dr. Von Fodór, of Pesth, spoke at some length, remarking that air thus heated loses none of its moisture, and even gains a little when passing through the channels used. He also dwelt on the facility with which the present system gave an agreeable warmth, but pointed out that a want of compliance with the proper rules for using air for heating purposes was sure to produce an unsatisfactory result. He concluded by observing that in a supply of hot air it was preferable, from a sanitary point of view, to have a large quantity at a moderate degree of warmth, rather than a relatively smaller quantity at a higher temperature.

The usual complimentary speeches were delivered at the close of the proceedings. On the previous evening the members of the Congress had been entertained in a hospitable manner by the municipal authorities. Besides the meetings we have recorded, the programme of the Congress included excursions to the Vienna water-reservoir, and to the Semmering.

The *National Zeitung* of Berlin, in commenting upon the meeting, remarks that an attempt was made to get through too much in the short space of time during which the Congress lasted. In addition to the detailed discussions we have referred to, the question of the use of alcohol was also debated at some length. The suggestion is made that when time is so limited, the papers should be printed and distributed, being taken as read. The saving of time would thus give more opportunity for those discussions which form such a valuable feature at scientific congresses.

ART AND THE CONDITION OF THE PEOPLE.

At the annual meeting of the Burslem Schools of Science and Art, a few days ago, Mr. William Morris, of London, delivered an address to the students, in the course of which he said:—Hold fast to distinct form in art. Don't think too much of style, but set yourself to get out of you what you think beautiful, and express it as cautiously as you please, but, I repeat, quite distinctly and without vagueness. Always think your design out in your head before you begin to get it on to paper. Don't begin by slobbering and messing about in the hope that something may come of it. You must see it before you can draw it, whether the design be of your invention or nature's. Remember, always form before colour and outline, silhouette before modelling, not because these latter are of less importance, but because they cannot be right if the first are wrong. Now, upon all these points you may be as severe with yourselves as you will, and are not likely to be too severe. Furthermore, those of you especially who are designing for goods, try to get the most out of your material, but always in such a way as honours it most. Not only should it be obvious what your material is, but something should be done with it which is specially natural to it, something that could not be done with any other. This is the very *raison d'être* of decorative art; to make stone look like ironwork, or wood like silk, or pottery like stone is the last resource for decrepitude of art. Set yourselves as much as possible against all machine work. (This to all men.) But if you have to design for machine-work, at least let your design show clearly what it is. Make it mechanical with a vengeance, at the same time as simple as possible. Don't try, for instance, to make a printed plate look like a hand-painted one. Make it something which no one would try to do if he were painting by hand if your market drives you into printed plates. I don't see the use of them myself. To sum up, don't let yourselves be made machines, or it is all up with you as artists. Much as I hate the iron and brass machines, the flesh and blood ones are more terrible and hopeless to me. No man is so clumsy or base a workman that he is not fit for something better than that. Well, I have said that education is the first remedy for the barbarism which has been bred by the hurry of civilisation and competitive commerce. To know that men have lived and worked mightily before you is an incentive for you to work faithfully now that you may leave something to those who come after you. What next is to be thought of after education? I must here admit that if you accept art and join the ranks of those who are to rise in rebellion against the Philistines, you will have a roughish time of it. "Nothing for nothing and not much for a dollar," says a Yankee somewhere, and I am sorry to say that is the rule of nature also. Those of us who have money will have to give of it to the cause, and all of us will have to give time, and thought, and trouble to it. And I must now consider a matter of the utmost importance to art and to the lives of all of us, which we can, if we please, deal with at once, but which emphatically claims of us time, thought, and money. Of all the things that are likely to give us back Gothic art in England, the cleaning of England is the first and the most necessary. Those who are to make beautiful things must live in a beautiful place. Some people may be inclined to say, and I have heard the argument put forward, that the very opposition between the serenity and purity of art and the turmoil and squalor of a great modern city stimulates the invention of artists, and produces special life in the art of to-day. I cannot believe it. It seems to me it stimulates the feverish and dreamy qualities that throw some artists out of the general sympathy. But apart from that, there are men who are stuffed with memories of more romantic days and pleasanter lands, and it is on these memories they live, as I say, to my mind not altogether happily for their art, and you see it is only a very few men who could have even these doubtful advantages. I abide by my statement that those who are to make beautiful things must live in beautiful places, but you must understand I do not mean to claim for all craftsmasters a space in those gardens of the world, or of those sublime and awe-inspiring mountains and wastes that men make pilgrimages to see; that is to say, not a personal share. Most of us must be content with the tales of the poets and the painters about these places, and learn to love the narrow spot that surrounds our daily life for what of beauty and sympathy there is in it. For surely there is no square mile of earth's inhabitable surface that is not beautiful in its own way, if we men will only abstain from wilfully destroying that beauty; and it is this reasonable share in the beauty of the earth that I claim as the right of every man who will earn it by due labour; a decent house with decent surroundings for every honest and industrious family; that is the claim which I make of you in the name of art. Is it such an exorbitant claim to make of civilisation, of a civilisation that is too apt to boast in after-dinner speeches; too apt to thrust her blessings on far-off peoples at the cannon's mouth before she has improved the quality of those blessings so far that they are worth having at any price, even the smallest? Well, I am afraid that the claim is exorbitant. Both you as representatives of the manufacturing districts, and I as representing the metropolis, seem hitherto to have assumed that, at any rate, there is not one family in a thousand that has established its claim to the right aforesaid. It is a pity though; for if the claim is to be considered inadmissible, then it is most certain that we have been simply filling wind-bags and weaving

sand-ropes by all the trouble we have taken in founding schools of art, National Gallery, South Kensington Museum, and all the rest of it. I have said education is good, is necessary to all people; neither can you if you would withhold it, and yet to educate people with no hope, what do you expect to become of that? Perhaps you might learn what to expect in Russia. Look you, as I sit at my work at home, which is at Hammersmith, close to the river, I often hear some of that ruffianism go past the window of which a good deal has been said in the papers of late and has been said before at recurring periods. As I hear the yells and shrieks and all the degradation cast on the glorious tongue of Shakspeare and Milton, as I see the brutal, reckless faces and figures go past me, it rouses the recklessness and brutality in me also, and fierce wrath takes possession of me till I remember, as I hope I mostly do, that it was my good luck only of being born respectable and rich that has put me on this side of the window among delightful books and lovely works of art, and not on the other side, in the empty street, the drink-steeped liquor-shops, the foul and degraded lodging. What words can say what all that means? Do not think, I beg you, that I am speaking rhetorically in saying that when I think of all this I feel that the one great thing I desire is that this great country should shake off from her all foreign and colonial entanglements, and turn that mighty force of her respectable people, the greatest power the world has ever seen, to giving the children of these poor folk the pleasures and the hopes of men. Is that really impossible,—is there no hope of it? If so, I can only say that civilisation is a delusion and a lie; there is no such thing and no hope of such a thing. But since I wish to live, and even to be happy, I cannot believe it impossible. I know by my own feelings and desires what these men want, what would have saved them from this lowest depth of savagery: employment which would foster their self-respect and win the praise and sympathy of their fellows, and dwellings which they could come to with pleasure, surroundings which would soothe and elevate them; reasonable labour, reasonable rest. There is only one thing that can give them this—art. I have no doubt that you think this statement a ridiculous exaggeration; but it is my firm conviction nevertheless, and I can only ask you to remember that in my mind it means the properly-organised labour of all men who make anything; that must at least be a mighty instrument in the raising of men's self-respect, in the adding of dignity to their lives. Once more, "Nothing for nothing and very little for a dollar." You can no more have art without paying for it than you can have anything else, and if you care about art, as you must when you come to know it, you will not shrink from the necessary sacrifice. After all, we are the descendants and countrymen of those who have well known how to give the lesser for the greater. What you have to sacrifice is chiefly money: that is, force and dirt,—a serious sacrifice, I know; but perhaps, as I have said, we have made greater in England aforetime; nay, I am far from sure that dirt will not in the long run cost us more in hard cash even than art will. So which shall we have, art or dirt? What is to be done, then, if we make the better choice? The land we live in is not very big, either in actual acreage or in scale of fashion; but I think it is not our natural love for it only that makes us think it as fit as any land for the peaceful dwellings of serious men. Our fathers have shown us that, if it could otherwise be doubted. I say, without fear of contradiction, that no dwelling of men has ever been sweeter or pleasanter than an ancient English house; but our fathers treated our lovely land well, and we have treated it ill. Time was when it was beautiful from end to end, and now you have to pick your way carefully to avoid coming across blotches of hideousness which are a disgrace, I will not say to civilisation, but to human nature. I have seen no statistics of the size of these blotches in relation to the unspoiled or partially-spoiled country; but in some places they run together so as to cover a whole county, or even several counties, while they increase at a fearful rate,—fearful in good earnest and literally. Now, while this goes on unchecked,—nay, unlamented,—it is really idle to talk about art. While we are doing this, or letting it be done, we are really covertly rejecting art, and it would be honester and better for us if we did so openly. If we accept art we must atone for what we have done and pay the cost of it. We must turn this land from the grimy backyard of a workshop into a garden. . . . . When you have accepted the maxim that the external aspects of the country belong to the whole public, and that whoever wilfully injures that property is a public enemy, the cause will be on its way to victory.

ARCHITECTURAL EDUCATION.*

UNIVERSITY COLLEGE, LONDON.

I propose for the present session to select the subject of Greek architecture for treatment in detail. Greek is the architectural style which, within certain narrow limits, approaches nearer to absolute perfection than any other, and it may, with perfect truth, be called the fountain-head alike of modern and of all Classic architecture. Should the result of this attempt seem to warrant it, I shall propose, in another session, to expand, in the same manner, the treatment of some other part of the course.

The Course B deals with the science of architecture, that is to say, with materials, and with construction (as the art of putting materials together in a building is called). We shall take the principal natural building materials, such as timber, stone, and marble, and the principal manufactured ones, such as bricks, cement, and iron, and try to become familiar with their appearance, their properties, their strength, their fitness for use in a building, and the indications of their being of good or bad quality; and when we know something about each material we shall try to follow it out in the building, and consider the parts of a structure in which it may be best employed. Thus, after timber will come floors, roofs, and various framings. After bricks and cements, we shall consider brickwork and such subjects as the bond of bricks, and foundations. The building-stones lead us to walling, masonry, arches, vaults, and the most difficult constructions that the builder has attempted; while, after considering iron, we shall learn something about fireproof floors, iron roofs, and other applications of iron to building.

These lectures on materials and construction are included in the course of study recommended to civil engineers. The materials and methods employed by the builder and the architect are, to a large extent, the same as those with which the engineer has to deal, though they are usually employed in larger masses in his structures than in ours, and under different conditions, requiring, more often, very close calculation of the stresses they have to resist. I trust that the engineering students who may attend the course will give the work of this class a due share of attention. Some of them have carried off the highest prize which it has to offer. Others have failed to obtain a certificate, and have been chagrined at their failure. Yet the lecturer, the professor, the examination papers, and the system of making answers, are the same for all. Success depends solely upon the pupil. It may be impossible for him to be the first in any given year; but, with ordinary abilities, nothing but application is required to secure a certificate of having passed the examination with credit. Want of time has prevented hitherto, and no doubt will still prevent, much attention being given by this class to joinery, plasterers' work, and the other finishings of a building; but some care will be bestowed upon the construction of drains and the sanitary fittings connected therewith, though for the full study of sanitation I must refer you to the lectures of my accomplished colleague, Professor Corfield.

I shall direct attention, also, not only to the properties and use of these materials, but to their defects and failure. It cannot be too strongly impressed upon the mind that from the day the workman leaves a building the tooth of Time begins to attack it. Forces of all kinds tending to produce decay and ultimate destruction are at work, and while structures of colossal strength, like the pyramids of Egypt, may keep them at bay for thousands of years, ordinary buildings are not long before they begin to suffer. The failure of buildings, and the precautions to be taken to avert it and to remedy it when it has become serious, will therefore form one of the subjects of this course.

The collection of diagrams illustrating courses A and B, prepared through many years, as I have already stated, by Professor Donaldson and Professor Hayter Lewis, now reaches to many hundreds of examples, chosen with special reference to the purposes of these classes, and represented in drawings of great excellence. These are, by the kindness of the two past professors, still available for the purposes of the class. The larger portion of them relate to the Art course, but there are a considerable number bearing upon Construction.

Some useful specimens of building materials of various sorts are available for illustration of the lectures on Construction. The series of specimens is, however, not extensive, and I am taking steps to increase it, so as in a short time to make it very serviceable as an aid to instruction. The collection of illustrations is also constantly increasing. I have added, and shall add, diagrams, prints, and photographs, and I hope occasionally to make use of photography in another way,—that is to say, to exhibit once, if not oftener, some illuminated photographs, by way of giving a more vivid representation of ancient buildings than is possible by the aid of drawings or photographs seen in the usual manner.

Course C.—The course of lectures on Practice is not so long a course as either of the others, and is intended chiefly for young men who have become to some extent familiar with the routine of professional work, and especially for those who are about to start in practice, or have recently begun practice on their own account. It is my desire in this course to put the student in possession, to a certain extent, of the results of experience, so that he may know what he is likely to have to do or encounter when acting as an architect on his own account. I need hardly point out that a pupil or assistant, especially in a large office, while probably enjoying ample opportunities of working on plans and specifications, is not always,—in fact, not often,—brought into contact with the negotiations that the architect with whom he is has to carry on, may not see much of the supervision of works, and, in short, looks at the transactions relating to a building from the point of view of an irresponsible *employé*, and not that of a responsible professional man. The aim of these lectures is to teach students some of the things which they would otherwise have to find out for themselves when entering practice, and which they had far better know beforehand.

The course travels over the following subjects, beginning with what is most likely to be familiar, at least in part, and proceeding to questions that are more and more special,—the preparation of plans and specifications, and the ordinary routine of building operations, including planning for special purposes and requirements; the preparation of all the required documents, conditions of contract, &c.; the principles on which estimates are prepared, the supervision of buildings, the usual mode of stating building accounts, and the professional charges which the architect is entitled to make. The next series of subjects in this course deals with those aspects of architectural practice which relate to law. Foremost, and of great importance, the London Building Act, and other Acts regulating buildings which have been founded upon it. Then the law of light and air, of contract, of the tenure of land and houses, and some account of arbitrations and of such questions as are most commonly litigated in connexion with building operations. Lastly, I shall endeavour to give you a brief account of that class of professional work which all architects are liable to be called upon to perform in connexion with existing buildings, such as surveys for dilapidations and various purposes, valuations, and the like.

I am sure that it will be of service to many a young architect to be warned and instructed beforehand about his routine, his charges, his Building Act difficulties, the restrictions he has to cope with when building on leasehold land, or the risk he runs where ancient lights are interfered with, rather than to have to buy his experience in these and similar matters at an expense of money to his client and of vexation to himself.

To this outline of the course of lectures I propose to add some account of the method pursued. The objects to be kept in view are twofold,—first, to convey information; secondly, to make the students think for themselves.

A large portion of the lectures is unavoidably devoted to giving information. It is of great importance to fix in the minds of the students those facts relative to their future profession which are most needful for them to know; so, of necessity, much of the time which the pro-

* Opening lecture of the courses in Architecture and Construction at University College for 1881-82, delivered by Professor T. Roger Smith, on the 10th inst. (see p. 490, *ante*).

fessor and his classes spend together is devoted to telling, or illustrating, or recalling the most important of those facts.

I am very desirous of inducing the students to draw. It is by the pencil that an architect learns as well as designs, and if it is possible to stimulate the use of the pencil to any extent by what passes in this class-room, it will be most satisfactory to me and serviceable to yourselves. I trust that the sketches which I make on the black-board will be always copied in your note-books, and that you will make sketches from the diagrams hung up. I shall continue the practice which Professor Donaldson established of lending the diagrams to students, and I shall be delighted if they are much borrowed and much copied, and I shall have pleasure in offering prizes for the best sets of sketches illustrative of the lectures A and B, and shall hope to find that there is a keen competition.

But the most serious part of my task remains behind. Can I teach the students not merely to know something about buildings or parts of buildings, or to draw them, but to understand them?—feel their value as works of art or as specimens of construction, and penetrate through the outward and tangible aspect of a material thing to that inspiring something,—that reason, or design, or contrivance, or historic import which gives to a congeries of bricks and stones and mortar a value which in some cases is literally beyond all price? Can I make you understand why the choir of Westminster is lovely, or what the secret principles are which hang the fretted roof of its Lady Chapel in mid-air? Can I enable you to study, and to some extent comprehend, ancient designs, and so take the first step towards yourselves becoming designers? I do not know, but it will be my endeavour to do something of this sort, and if I can see that even to a very small extent I have been successful in making you think for yourselves, I shall be far more satisfied than if I find your minds crammed full of facts and dates, and matters which can be learned by rote, and which it is often possible to know without understanding them.

The method of lecturing established by Professor Hayter Lewis will be continued, at least through this session. It is a method more serviceable to the student than agreeable to the Professor; but I believe it affords a very good means of learning what is taught, and reduces to a minimum the risk of mistakes in your notes. The plan is this. The heads of a portion of the lecture will first be dictated slowly, sentence by sentence, and are to be written down by the class as I read them out; and then, after this is done, I shall go over and explain the portion of the subject which the notes cover. This ought to ensure correctness in your notes, and gives an opportunity for revising them to a certain extent; but I value it chiefly because it leaves the students free to listen with their eyes as well as their ears (and, believe me, the eyes help you wonderfully to understand what is said), without being distracted by the effort to follow the lecturer and fill the notebook at the same time. I may perhaps now and then vary this plan for a single lecture. Occasionally, at any rate, it will be desirable for you to hear, and me to give you, a connected discourse not disturbed by the breaks to continuity which such a system entails. I shall be sometimes glad, especially when trying to show you the principles that underlie architectural rules or practice, to be as uninterrupted as possible, and you will probably be the better for having occasionally to give continuous attention. When this is done I will take care that an outline of the heads of the lecture is provided for each of you, so as to leave you free to follow me.

It has been the custom, and one which I hope to follow as an additional means of interesting and instructing the classes, to take the students to one or two of the great buildings of London and to some large builder's yard, when the opportunity will occur of seeing in actual fact some of the matters which form the subject of our lectures, and where, perhaps, the habit of examining buildings and works in progress may be encouraged, and the method of investigating ancient work learned.

A notice of the routine pursued here would be incomplete were I to omit the examination and prizes. The examination, the results of which determine the prizes, takes place at the close of the session; it is entirely in writing or by sketches, the questions being printed, and the prizes are publicly presented at the college. An alteration has been made this session, by which the work of the entire year will be treated as one whole. Formerly it was divided into two portions, and the arrangements were such that only half the work done by a student was the subject of the final examination. An attempt to remedy this last year by holding two examinations was found inconvenient in practice, and this time the examinations at the close will cover the work of the whole session in each class. An examination, properly looked at, is an admirable feature in a course of instruction. It enables a student to recognise the progress that he has made, and compels him to make some use of what he has learned. I shall probably, therefore, introduce one additional examination during the session in each of the classes A and B, not to be counted towards the award of prizes, but solely for the purpose of aiding students. Let me add that it is most desirable that every person attending the class should attend the final examination, and do his best to obtain, if not a prize, at least a certificate. The prizes include two silver medals given by Professor Donaldson, and bearing his name, together with valuable prizes of books. The certificates are given to as many students as obtain a certain proportion of marks out of the total possible; and it is fair here to point out to you that the best way of obtaining a good proportion of marks is not to write long answers, and to bring in irrelevant things which the student knows, but which form no part of the correct answers to the question; but to write accurate and clear replies, which shall, on the one hand, answer every part of the questions, and, on the other, shall not travel beyond the questions, and to illustrate them, wherever possible, by well-drawn sketches. Where an answer is given, wholly or partly, by a sketch, I always, in marking the paper, first allot as many marks to it as would have been due to a correct reply in writing, and then add something more for draughtsmanship if the sketch shows any merit.

Thus far it has been my aim to show to you, gentlemen, what this college has been doing for years past, and what I, as its Professor, propose to endeavour to do in the coming session for such of you as become students. I must not close without some remarks upon what you must do for yourselves, and upon the degree in which our work here may be an aid to you in that which occupies you during the greater part of your time.

I have already said that in an office you learn practice,—in the class-room you learn principles. If this be so, it is not difficult for you to see that as you master principles here, you will find they enable you rapidly to get a firm hold upon practice elsewhere. Take the most important branch of your work, in the office or out of it,—your drawing. The arrangements of these classes do not, it is true, provide for instruction or, except just incidentally, for practice in drawing; but there is hardly a part of either the construction or the architectural treatment of a building which you will not draw far better when you know the reasons for its taking the shape it does. The simplest part of your work,—the working out of plans,—will explain what I mean. The beginner is often in difficulties as to the thicknesses of brick walls. I hope, when he has been through the part of this course which refers to brickwork, that the sizes of bricks and the mode of combining them into walls will be made clear to him for life. Another illustration may be taken from a more advanced sort of work. The elevation of a building ought to have,—I think, will have,—more interest for a student who knows something about the features employed, than if he simply copy them unintelligently. For example, if the Orders occur, he who knows something of how and where they originated, what their earliest forms were, and where they were matured, will draw with more understanding and pleasure, and will, therefore, be sure to draw them better than one who only knows that he has gone through a rather irksome task in drawing them out after some typical example. The man who has some general acquaintance with the forms of architecture and its history will be prepared to deal with whatever period or style he has to work at, as something not quite strange to him. The same thing is true of materials and constructions. When, for example, you understand the reason of the shapes and relative sizes of the timbers in a roof, and why their joints are shaped as they are, and what purpose each part has to serve, you will feel more interest in drawing such roofs as you may have to put into plans, and you will undoubtedly draw them with fewer mistakes. When you have been told what are the main peculiarities of the leading building-stones, or the sorts of timber most used, and when you know what marks indicate good quality, and what the reverse, you will not only find a walk round a building instructive, but may soon become able to make yourselves useful in aiding, to some extent, in the superintendence of buildings. At any rate, after having mastered some of the elementary principles of materials or of construction, you will be able to take in and assimilate the information which the accidents of practice bring within your reach.

As a general rule, I believe that a young man who has already spent some months or a year in an office is more likely to get benefit from these classes,—especially from the Construction class,—than one quite new to the subject. On the other hand, I believe, as I have stated, that to a youth just fresh from school or college, the opportunity of some systematic and scholastic teaching on subjects connected with his profession is of importance,—so much so as to outweigh any disadvantage arising from his being new to the subject. A student so circumstanced should attend the Art class, and that only, in his first year, and should take the Construction class the year after. If, however, a student has been a year in an office (much more if he has been a longer time) it may be advantageous to him to attend both classes in the same year. This is, however, partly a question of the amount of time he can give to the work at home which attendance here involves.

I hope it will be distinctly understood, and always borne in mind, that the student who wishes to get real benefit from these lectures must devote some time to them at home each week, besides attending his hour here. The notes should be carefully written out in ink, from the rough notes made in the room, and the sketches made from the black-board should be carefully and neatly copied into the permanent note-book. The books of reference mentioned should be consulted; but most and chiefly, everything connected with the subject of the lectures of which illustrations can be found should be drawn. The diagrams afford a mine of wealth of this sort, and the generous practice of lending them, under proper restrictions, to copy, affords an opportunity of making the fullest use of them. Much information may be gained by copying, sketching, or reducing these diagrams; but the student who wishes to make the most of his opportunities should also draw or sketch such illustrations in other books, or such photographs, or such pieces of actual work as come under his notice, and are of a nature to elucidate the subjects being treated. I have had the pleasure to receive excellent sets of illustrative sketches in previous sessions, and I repeat that I sincerely hope this may be the case in the present session.

Allow me to express my hope that most, if not all, students will attend the Art class. I believe it to be of the greatest possible importance, and that attendance at the Science class alone is a very incomplete and one-sided mode of education, even for an engineer or a surveyor, much less for an architect. It is hardly possible to convey to you how keenly a critical observer is sometimes made to feel the disgraceful want of knowledge which English architecture too often betrays. Features which are inaccurate are constantly to be met with in designs otherwise so simple that a very small amount of education would have insured correctness. Features that are incongruous are frequently put together, and spoil the effect of many a building which, had its author's cultivation only been such as his talents deserved, might have been a complete success. Of course, attendance in the Art class is no guarantee of correctness; but a very considerable amount of such information as no architect, no draughtsman, no civil engineer, ever ought to be without, is put within the reach of the students of that class, and I can venture so far as to say that no young man of intelligence who has gone through the course and worked at it fairly and thoroughly, ought to be able,—I think I may say would be able,—to design such incongrous elevations and details as would be found, if we went to look for them, within a hundred miles of the centre of this great metropolis.

As to the Professional Practice course, it is not designed for beginners, and probably few students who have been less than three years in an office will be able to reap the full advantage of attending it; while I hope that to many

who are much more advanced these lectures may be serviceable. They have been attended during the short time that they have been given by architects in practice as well as by senior students, and, as already explained, they will be directed specially to the requirements of those who are beginning, or are hoping soon to begin, practice.

In conclusion, perhaps, I may be pardoned if, passing away from the subject which has occupied our attention, I say one or two parting words about work and study outside these walls. In fact, I feel as if I could hardly close without some allusion to your own studies. Many topics might be touched upon; but I will limit myself to a passing remark or so upon each of four,—drawing, practical work, books, and the study of ancient buildings.

Before anything else, it is of importance to you to draw, and to draw well. You ought to be able to represent, fairly well, anything you see. And if you wish to attain this power, nothing is so useful as studying the human figure. The Slade school here is the best school for the purpose that I know; but those who cannot give the time in the day-time may be able to draw at one of the schools of art where the antique is studied in the evening. With your drawing-instruments you ought to be able to work as easily as an ordinary draughtsman using the pencil alone. To handle the tee-square and dividers thus readily requires long practice; but till this facility is completely attained, the instruments will always be a little in your way. Long before that time, however, you ought, so far, to master the use of them that all your ink lines shall be true and even, all your circles really round, and all your right lines really straight; and if this degree of steadiness has been perfectly mastered in a student's first twelve months, it is a not discreditable performance, and perfect command of the instruments will follow in time. Practice sketching things you see, especially portions of buildings; and, in short, strive to become, in every sense of the word, skilful, artistic, and rapid draughtsmen. Above all things, practise yourselves in designing. The power of originating architectural compositions may be latent in many of you; but effort is as much required to bring out that power as to make manifest any other latent capacity or gift. Design is fostered by study; but a man may be studious without a particle of inventive power, or may perhaps neglect invention for the attainment of knowledge, and by so doing impair his ultimate success as an architect. Practise designing, therefore.

Next in importance to drawing comes practical work of any sort. The most useful of all is to go into a workshop and learn to make something belonging to a building. By the time he has become able to make a four-panel door, a youth will gain such an acquaintance with construction as will prevent his making half the mistakes which disfigure most working drawings turned out by young hands. But whatever piece of practice of any sort is within reach, examine it, and get a share in it. The commonest office work done intelligently may impart valuable knowledge. To trace drawings or copy specifications, if only the young clerk determines to understand all that goes under his hand, is a means of gaining all kinds of instruction, and a six-roomed house, if only it be watched closely from day to day, would afford a fund of information as to materials and construction. Do not, therefore, neglect or despise the humblest opportunity of seeing or sharing in any sort of practical work which comes in your way.

The use of books has already been considered at some length. I should like to suggest that the student should not only by degrees form a library of the best books of reference (taking care to get the best), and that what he buys he should read; but that he should make use of the fine public libraries accessible in London, and in not a few of our great towns. There are a few good architectural books in the library of this college, free to students. There are some, I believe, at Sir John Soane's Museum; and the three great art libraries of the Royal Academy, the South Kensington Museum, and the Royal Institute of British Architects, supplemented by the Library of the British Museum and the loan library of the Architectural Association, furnish the London students with the means of consulting every book of reference that exists, and every illustrated treatise on our art, with little inconvenience, in some instances at absolutely no expense, and in other cases for a merely nominal fee. Do not, therefore, neglect the magnificent opportunities for making use of good books which exist within your reach.

Last, but by no means least, comes the study of ancient buildings. This is alone the source of inspiration and of accurate knowledge for the architect. Set it down in your minds that your best opportunities are those which give you time to measure or sketch some good example of English or foreign architecture, and that your training will remain incomplete unless one good long journey, or more than one shorter one, shall have enabled you to study examples on the Continent of Europe as well as English ones. It is not buying prints and photographs which puts knowledge into your minds; it is the process of patiently watching, examining, and, so to speak, absorbing the peculiarities of your subject while you draw it, that enables you really to know it; and, let me add, this is much more thoroughly accomplished by the process of making a set of geometrical drawings from the solid work than by representing it in a perspective, however cleverly and prettily that may be done.

If the variety and extent of study which is here hinted at,—prolonged, as it ought to be, through a series of years, and, in fact, more or less kept up through life,—seem formidable, let me remind you that the profession of an architect is not an easy one, and that it is only by unremitting, careful, and studious work that the student can fit himself for the discharge of its various duties and render himself equal to its responsibilities. But in almost every department of these studies there is much to interest and even to fascinate the mind. There is hardly any amusement undertaken for pure pleasure which is so enjoyable as a sketching tour through a district rich in works of architecture. There are few professions where the anxieties and hard work inseparable from all the real business of life are lightened by so many occupations of a kind which it is a pleasure to engage in, and none, so far as I know, where the advantages of variety of employment are so fully enjoyed. A calling such as you will find architecture to be, if you heartily throw yourselves into it, demands that those who engage in it should fit themselves for it by sufficient training and assiduous study. It will be my part to attempt to offer to my students a portion of this training, and I trust that those of you who join my classes will come prepared to study with such assiduity as to command, as well as deserve, success.

EXHIBITION OF WORKS OF ART APPLIED TO FURNITURE, 1881: AWARDS.

The following is the report of the judges appointed by the Council of the Society of Arts to make the awards of silver and bronze medals offered by the Society to the Designers and Art Workmen whose work was in the Exhibition of Works of Art applied to Furniture, held in 1881, at the Royal Albert Hall.

1. The collection of works of art included many branches of artistic handicraft, such as carving and inlaying in wood, ivory, &c., cabinet work and fine joinery, painting on various materials like wood, glass, and pottery, glass-cutting, the process known as *pâte sur pâte*, beating and chasing metals like silver and brass, wrought-iron work, modelled and glazed stoneware, and decorative needlework. The arrangement of the objects had been undertaken by the various exhibiting firms. A definite space had been assigned to each firm, who decorated it with hangings or with painted and gilt moulded work, or wood panelling, &c., and then disposed within it the various objects of furniture, &c. We were much pleased with the general good taste displayed in the separate divisions and in the aspect of the Exhibition as a whole.

2. In bay No. 1, occupied by Messrs. Crace & Son, the important cabinet of carved walnut wood was distinguished for its excellence. A number of hands, it was stated, had been employed upon the carving, which called forth our admiration. It was, therefore, not possible to single out one art-workman to whom a medal might have been awarded. For the same cause no distinction could be awarded in respect of the admirably-inlaid octagon table of walnut wood, the design for the ornamental border of which has been made by Mr. J. D. Crace. The painting done upon a cabinet of satin wood, by Mr. Herman Scholz, as well as the daintiness of his rendering of the little figures of boys in the medallions, merit the distinction of a bronze medal. In this bay a tray and set of tea-things, in a dark olive-green body, ornamented with applications of well-depicted forms in white paste (*pâte sur pâte*), exhibited by Messrs. Mintons, and designed and executed by M. Solon, we especially commend as worthy of a silver medal.

3. The decoration of the side of a room, exhibited by Messrs. Morant, Boyd, & Blanford, remarkable for the excellence and finish of the work, was based upon a scheme good in its proportions, and the blending of the delicate tones of colour adopted, with those of the damask panels, and the details of the ornamental forms used, redound to the good taste of the designer, Mr. V. Barnard. Messrs. Morant, Boyd, & Blanford also exhibit a satinwood cabinet, and we consider that Mr. H. Reich, who inlaid the frieze of interlacing garlands upon the front of the drawer and the central ornament of the flap, should be rewarded with a bronze medal.

4. Near bay No. 2 hung three red lustre plates, the work of Mr. W. de Morgan, to whom a silver medal should be given for suitability of design to the materials employed, as well as for the fine tones of colour and lustre obtained.

5. In Messrs. Jackson & Graham's cabinet and chimneypiece, of a so-called Oriental Greek character, extraordinarily delicate and perfectly fitting marquetry work, and very finished cabinet-makers' work, attracted attention. A bronze medal is due to Mr. A. Reich, the marquetry-worker, and a bronze medal to Mr. A. Baldwin, cabinet-maker; to Mr. Marchant, who is understood to have assisted in the cabinet work, we award one of the Society's certificates. Beneath the chimneypiece in rosewood, with plaques of inlay of ivory, ebony, and mother-o'-pearl, designed by Mr. Allwright, was a wrought-iron grate, of simple design, in good taste, made by Mr. Sayer, a member of the firm of Messrs. Feetham & Co., who exhibited other grates and fire-irons of good pattern and workmanship. A piece of embroidery, designed by Mrs. Alfred Morrison, who prescribed the colours and selected the materials used, greatly pleased us by the excellent distribution of Oriental motives, as well as the beautiful harmony in colour displayed in it.

6. The walnut seat for a vestibule, understood to be a copy of an old French design, reflects great credit in respect of its workmanship upon the exhibitors, Messrs. Gillow & Co. The carving, by Mr. M. Anderson, of the pendent heads of the canopy, and scrollwork on the arms of the seat, is well done. Carving in satinwood of garlands, on a small scale, but in high relief, and also of medallions, with a layer of satinwood upon a ground of ebony, in imitation of cameo-cutting, executed by Mr. Ross, to decorate the satinwood cabinet, made for the Empress of Russia by Messrs. Gillow, showed much skill in the execution, but in a direction of doubtful taste.

7. The carving of panels of boxwood let into a rosewood cabinet exhibited by Messrs. Holland & Sons was commendable.

8. In bay No. 6, some lightly-constructed furniture, including a stand in dark wood, after a Japanese model, and some chairs after good models of the Chippendale and Sheraton period, shown by Messrs. Howard & Co., was particularly noticeable for its gracefully designed and well-cut ornamental details. A rosewood chimneypiece showed good cabinet-maker's work. The designer of these pieces is Mr. Randal, whom we select for an award of a bronze medal, as well as for his design for a white metal fire-place and fittings. Some extraordinary specimens of glass cutting and engraving, by Mr. Northwood, who has produced a very remarkable *fac-simile* of the "Portland vase," probably unique as a work of glass-cutting of modern times; and a vase, called the "Milton vase," designed by Mr. Pargeter, of the Red House Glass Works, were exhibited by Mr. Pargeter. To the glass-engraver, Mr. Northwood, we award a silver medal.

9. Messrs. Wright & Mansfield contributed several excellent examples of inlaid work of the English eighteenth-century style, in the manner of Chippendale, Adam, and Sheraton, as well as work enamelled and decorated in the style of designs by Pergolesi. Awards of bronze medals were made to Mr. Thomas Hinton, the foreman workman, and to Mr. Victor Reich, the marquetry-worker, and of certificates to Messrs. Samuel Bryne, Charles Humphreys, and Thomas Miller, cabinet-makers, by whom the more important of these works were produced. The

carved and gilt mirror frames and girandoles in the style of the eighteenth-century English, and of Louis XV. French periods, especially three placed over the sideboard, were noted for superior workmanship, the carving being done by Mr. John R. Wingfield.

10. The modelling of the relief ornament carved by many hands, in a deep red mahogany mantelpiece and cabinet exhibited by Messrs. Collinson & Lock, was particularly good, and we award a silver medal to Mr. Webb, the modeller, for this and for many other specimens exhibited. His design for metal sconces was distinguished for richness in arrangement of conventional foliage, well grouped, and modelled with good effect of low relief and harmony in flowing lines. The metal-worker who wrought this design in brass is Mr. Singer, to whom we award a bronze medal. Of a different style, but of much excellence, the design being by Mr. Lock, the modelling by Mr. Webb, and the actual metal-work by Mr. G. Price, was a mirror frame of *repoussé* oxydised silver. We award a bronze medal to Mr. G. Price for his metal-working. The whole of the collection of furniture exhibited by Messrs. Collinson & Lock was noticeable for the completeness of workmanship throughout.

11. Some wrought iron by Mr. Sidney Phelps, of Sidney Sussex College, Cambridge, deserves mention, especially the panel for a balcony, which was of a good style of design, with interlacements of rod iron and beaten leaves of plate iron. The figures in the small panels, of deep modelled relief in terra-cotta, designed and executed by Mr. G. Tinworth, are full of expressive action, and we consider that a certificate should be awarded to this artist. We award a second certificate to Mr. G. Tinworth, the designer of the large flattened, circular bowl, executed in stoneware, and shown by Messrs. Doulton; and a certificate to Mr. Edward Sears, for his careful and clean painting in monochrome on two tiles, called respectively "A Saucy Companion" and "An Odd Chicken." We desire to commend the skill displayed in two delicately-carved birds in lime-wood, the work of Mr. W. Perry. Two panels of painted glass, suitable for the decoration of a house or hall, representing "Art" and "Science," appeared to us to show a right appreciation of the application of coloured design to glass, without detracting from its utility as a window through which light has to pass.

12. In bay No. 9, containing articles exhibited by Messrs. Gregory & Co., the reproduction of an old English arm-chair, enriched with carved and turned rails, and a little tea-table, were highly finished in workmanship, and commendable for the lightness of their construction. We award a bronze medal to Mr. W. P. Collins, the designer of these articles. To the designer, Mr. T. W. Hay, of the woven hanging, for the drawing and arrangement of details, as well as for good harmony of colour, we propose to award a certificate.

13. The well-proportioned framework or walnut panelling, for the dining-room or hall, shown by Messrs. Johnstone, Jeanes, & Co., in bay No. 11, was excellent in design, but, in our opinion, the effect would have been better if simple wood panelling instead of tapestry had been used. As it was, it produced the impression of an open screen which had been filled up, rather than of a wall.

14. The carving of the students of the School of Wood Carving, South Kensington Museum, was meritorious; and the pilaster executed by Miss Eleanor Rowe, of this school, showed good feeling for flow of line and the modelling of surfaces. It may be well to mention here that a principal aim of this school is to cultivate the production of wood-carving in a broad style, and at a cheap rate, similar to that used so largely for decorative purposes in the eighteenth century in this country. The works of this school are not, therefore, intended to compete with more expensive and more highly-finished wood-carvings.

15. We award a silver medal to Mr. R. Gleeson, for the suitable and graceful fan-mounts, which he has designed and executed, especially that of ivory, mounted with Mechlin lace. The inlaid amboyna-wood table, the work of Mr. Thomas Jacob, gained the distinction of a bronze medal, for the beauty of the marquetry work.

16. In concluding our report upon this Exhibition, we are of opinion that annual exhibitions, at which are shown various classes of fine art applied to industry, such as those represented at the present Exhibition, might be usefully supplemented were designers for all sorts of handicrafts and manufactures to be encouraged to submit drawings and sketches of designs which have actually been carried out. A section was allotted for such drawings at the Paris Exhibition of 1878; and, in our opinion, much useful instruction and information might be gained from such an annual display of designs to the benefit of producers and consumers.

George Godwin (F.R.S.).
Montague Guest (M.P.).
Edward J. Poynter (R.A.).
Alan S. Cole, Hon. Secretary.

August 5th, 1881.

The Viscount Hardinge wrote to express his regret at being prevented from attending the meeting.

LIST OF AWARDS.

Silver Medals.

M. Solon, for olive green tea-service, *pâte sur pâte*, (Messrs. Minton); Mr. de Morgan, lustre plates; Mr. Webb, modeller and designer (Messrs. Collinson & Lock); Mr. R. Gleeson, for carved fan mounts; Mr. Northwood, for glass cutting and engraving (Mr. Pargeter).

Bronze Medals.

Mr. H. Schols, for painted furniture (Messrs. J. G. Crace & Son); Mr. Vernon Barnard, designer of side of room (Messrs. Morant, Boyd, & Blanford); Mr. J. R. Randal, furniture designs and design for fender (Messrs. Howard & Co.); Mr. Albert Reich, marquetry-worker (Messrs. Jackson & Graham); Mr. H. Reich, marquetry-worker of cabinet (Messrs. Morant, Boyd, & Blanford); Mr. William Allwright, designer of rosewood chimney-piece, inlaid with ivory, ebony, mother-of-pearl (Messrs. Jackson & Graham); Mr. Baldwin, cabinet-maker (Messrs. Jackson & Graham); Mr. T. Hinton, foreman cabinet-maker (Messrs. Wright & Mansfield); Mr. Victor Reich, marquetry worker (Messrs. Wright & Mansfield); Mr. Singer, for beaten brass-work (Messrs. Collinson & Lock); Mr. G. Price, for beaten oxydised silver frame (Messrs. Collinson & Lock); Mr. W. P. Collins, designs for furniture (Messrs. Gregory & Co.); Mr. T. Jacob, for marquetry top to table.

Certificates.

Mr. Marchant, cabinet-maker (Messrs. Jackson & Graham); Mr. C. Humphreys, cabinet-maker (Messrs. Wright & Mansfield); Mr. T. Miller, cabinet-maker (Messrs. Wright & Mansfield); Mr. S. Byrne, cabinet-maker (Messrs. Wright & Mansfield); Mr. M. Anderson, carver (Messrs. Gillows); Mr. T. W. Hay, designer of woven silken fabrics for room decoration (Messrs. Gregory & Co.); Mr. G. Tinworth, terra-cotta panels; Mr. G. Tinworth, designer and modeller of flattened round bowl, shown by Messrs. Doulton; Mr. Edward Sears, for painted tiles; Miss Eleanor Rowe, for carved wood pilaster; Mr. W Perry, for carving in wood; Mr. Sidney Phelps, wrought-iron work; Mr. W. C. Codman, designer of panelling (Messrs. Johnstone & Jeanes).

IMPROVEMENT IN THE FIRING OF KILNS.

In no respect has the art of manufacture, in any of its main branches, made more advance during the present century than in what regards the economy of heat. Let any one glance back to the ancient modes of melting iron, of making steel, of burning lime! How rude and simple were the earliest procedures! To make a bonfire, and throw the ore or the limestone on it, or to bank up charcoal with mud to keep in the heat, were the first attempts at reduction. Small wonder that such was the case, when the very theory of combustion was unknown. It is but comparatively recently that manufacturers have become aware how much invisible fuel, as well as how much unused heat, was allowed to escape from the open mouth of the furnace. In our domestic consumption of coal, indeed, we keep to the good old plan (for the coal merchants) of sending some 70 or 80 per cent. of our heat and unburned carbon up the chimney. But in the processes of metallurgy, and in the production of steam, we have already effected very great economy, and not a year passes without some improvement in that path in which John Ericssen, in the construction of his caloric engine, was the pioneer.

A new application of the theory of the economy of heat has recently been made in one of those industries in which old wastefulness, and we may even say savagedom, have long maintained their ground. By no class of working men have improvements been more steadily and wrathfully resisted than by the brickmakers. The old brick-kiln was a mode of applying heat conspicuous for its simplicity, —not to use a harsher term. Mr. James Dunnachie, of the Glenboig Star Fire Brick Works, near Glasgow, has here been taking a leaf out of the valuable receipt book of Dr. C. W. Siemens, with signal success. His efforts have been directed at the same time to the use of gaseous fuel for burning his fire-bricks, and to the economising the heat produced by combustion. The first requisite was supplied to him by the "Wilson gas-producer," an invention which is closely connected with the Cleveland district. The construction of the new cellular kilns, we suppose, is due to the invention of Mr. Dunnachie himself.

The kiln is described as consisting of a series of ten separate chambers, all of the same size, and each having a capacity to hold 13,000 or 14,000 bricks. The chambers are arranged in two rows of five each, 24 ft. apart; the whole being covered by an iron roof. Gas and air flues are built under the chambers. The object of the arrangement is to draw successive charges of bricks, from chamber after chamber, utilising the heat that passes from one for raising the temperature of the next. Thus when the work of one chamber has been effected, and the bricks which it holds have been thoroughly burned, the current of gas from the gas producer is turned into the next chamber, and the atmospheric air requisite for combustion is made to pass through the first chamber, from which it extracts the heat no longer than required. The calorific power of the mixture of gas and heated air is intense, and the burning of each set of bricks is effected in from eighteen to twenty-four hours. It is expected that when the whole set of apparatus is brought into regular daily work a clamp of bricks will be thoroughly fired in twelve hours. In the best type of coal-fired brick-kiln hitherto constructed a firing takes from four to five twelve-hour shifts; that is to say, from forty-eight to sixty hours.

The economy in heat, if not quite equal to that in time, is said already to reach 50 per cent., as compared with coal firing, and is anticipated to reach fully 75 per cent. We can see no good reason for doubting the promise. A very perfect utilisation of heat is conceivable by means of these several chambers. The air passing from the bricks actually being fired at a very high temperature, raises the walls of the second chamber almost to a red heat, before the actual firing commences. The question of the regulation of blast, and of the serial heating of the chambers, is one of which the detail is susceptible of very great modification, as to which practice will, no doubt, be the best guide. But as it is the aim of the engineer to make the steam produced in the boiler part with all its heat in the form of mechanical power, and issue cool and damp to the external air when its work is done, so is it the object of the kiln-master first to heat the air to the temperature of flame, and then to rob this air of the whole of this imparted caloric, heating, in the rush of the great draught through the flues and chambers, first the walls of each cell, and then the contained charges, to such a degree as to reduce the firing specifically given to each charge to the minimum of the exact dose of heat required for the perfect firing of the bricks.

OUR NEW DOCKS.

We observe that Cardiff, which is a port of much larger trade than Swansea, is also on the alert for improvement. An application was made recently by the town authorities to the Marquis of Bute, the great land and coal owner of the locality, either to sell his dock to the Corporation, or to build a new one, and the Marquis announced his intention of doing the latter.

This great enlargement of our dock accommodation is a feature of no small importance as regards the industrial progress of England. It has a special and direct interest for the building trade. At Leith, at Liverpool, at Folkestone, at Swansea, at Milford, we have had to describe new harbour works. Cardiff, and London herself, are preparing fresh accommodation for their shipping. It may be said that the dock-builders have the courage of their hopes. Of all those great industries by the returns of which the movement of British wealth can be measured, —coal, iron, copper, lead, tin, zinc, textile industries, railway traffic, shipping,—it is the last alone that has maintained an unchecked increase, year by year, for the last ten years. Its vitality seems more independent of the general activity of production than that of any other occupation, which no doubt is due to the fact that shippers have two strings to their bow, and profit alike when the world demands the product of our looms, forges, and factories, and when we have to ask from the foreigners what we cannot produce at home. Since 1851, our gross tonnage has risen from 16,000,000 to 37,000,000 tons. But we can hardly expect so swift a march to be continuously maintained.

ROMAN ANTIQUITIES.

At a meeting of the St. Paul's Ecclesiological Society, held in the Chapter-house, St. Paul's Churchyard, on Tuesday evening, Major Heales in the chair, an interesting lecture upon the Roman antiquities discovered in Warwick-square, Newgate-street, was given by Mr. Alfred Tylor. The principal objects discovered (recently described by Mr. Tylor before the Society of Antiquaries) were exhibited, the most prominent being a leaden ossuarium and a glass cinerary urn found within it, and a very fine vase of serpentine, which, when found, contained a coin which dated from about 54 A.D. Mr. Tylor, in the course of his remarks, touched upon the relation of the Mithraic religion to Christianity, a subject suggested by various emblems found on some of the remains, and adverted to the excellence of the cast lead-work exhibited by the ossuarium. The exact positions in which the various objects were discovered, their depth from the surface, and the nature of the stratum in which they were found, were delineated on some very complete coloured drawings made by Mr. Tylor. In some interesting remarks he traced the principle of heredity in Christian and other symbols as seen in Roman sculptural remains, coins, &c., and subsequently he indicated the course of some of the principal Roman roads in Britain.

In the discussion which followed,

Mr. Milman, director of the Society of Antiquaries, observed that the objects discovered by Mr. Tylor were far superior to any that had yet been found in England. The fine serpentine urn was unique in this country, and almost unknown on the Continent. Mr. Franks, a great authority on such subjects, had expressed the desire that the objects found by Mr. Tylor should become a part of our national collection, and in that desire he heartily shared. The value of Mr. Tylor's discoveries was greatly enhanced by the extreme care with which he had recorded the exact positions of the various objects when found. In conclusion, Mr. Milman referred to the excavations about to be undertaken for the completion of the Inner Circle Railway by carrying it through what was a very interesting portion of Roman London, and said he was glad to learn that the attention of Mr. Price and other antiquaries who had made Roman London their study would be given to the progress of those excavations.

The Rev. Charles L. Acland, Hon. Curator of the Museum at Colchester, gave an epitome of Roman methods of interment, as illustrated by the contents of that museum, and urged that all who were connected with or interested in public or semi-public institutions such as museums should exercise watchfulness in localities where "finds" were likely to be made, in order to secure for public collections the objects found. Somehow or other, workmen who made these finds always knew exactly where to go in order to sell (generally for a mere trifle, such as the price of a pot of beer) objects of priceless value to the antiquary. Unfortunately for the public, there were people who would buy such things, and "ask no questions," and thus, no doubt, many specimens of great interest were kept hidden away in the hands of private persons, until it was forgotten whence they came, and perhaps they were ultimately lost, and so never reached a public museum, where they would be seen by those most competent to form an opinion upon and deduce lessons from them.

The Rev. Mr. Mayhew having offered a few observations, a vote of thanks was, on the motion of the Chairman, tendered to Mr. Tylor for his interesting lecture.

Ironworks and Collieries.—The prospectus is in circulation announcing the registration of Newton, Chambers, & Co., Limited, with a capital of 650,000*l.* in 20*l.* shares. This firm has existed nearly a century, and the reason for sale is that some of the numerous trustees on whom the properties and works have devolved on the successive deaths of the partners, have no power to continue the working beyond the approaching termination of the deed of partnership. The names of well-known and experienced noblemen and gentlemen appear on the board, and the terms of purchase are certified by competent engineers to be fair and reasonable, being based on the low prices at which they stood in the firm's books on the 31st December, 1880.

DOORWAY OF THE CHURCH AT WETZLAR.

We have frequently had occasion to call attention to the remarkably interesting church of Wetzlar on the Lahn, and we have noticed, in a previous number, the proof which the unfinished front of that church presents that Mediæval builders erected their buildings after the English manner, and not in the mode common at present on the Continent; that is to say, the details and ornamentation were worked before the stone was fixed *in situ*, instead of the stone being put up in block, and carved afterwards. It also proves that each separate feature of the building was finished off as it was erected, and not left to receive its finishing touches after the completion of the main edifice.

The doorway which we illustrate in our present number corroborates these facts in a very remarkable manner; for, although the walls of that part of the church are not carried up half their height, the whole of the ornamentation of the doorway is complete, and even the greater part of the statuary is fixed in its place. This consists of a beautiful figure of the Madonna attached to the centre pier, and those of the four Evangelists in the jambs. In the tympanum is a "Majesty," with statues of Mary and John the Baptist, and two angels offering incense. The lower part of the tympanum is ornamented by thirteen niches, probably intended to be occupied by statues. Looking through this doorway, which, by the bye, has never been supplied with doors, the lower portion of the more ancient west front is to be seen, with its very remarkable double portal, adorned with curious imitations of snakes or worms, carved in a black basaltic stone. The date of this front seems to be uncertain, though it is probably a work of the eleventh century.

The later doorway, like all the more modern portions of the church at Wetzlar, is constructed of fine red sandstone, which has resisted the weather excellently, and retained the sharpness of the sculpture in an extraordinary degree. We should like to ask some of our scientific readers how they account for the fact that the red sandstone of Germany retains its surface after many years of exposure to the air, whereas the English red sandstone, which seems to be of a similar formation, appears to have stood less well than any stone used by our Mediæval architects. The dampness of the climate would certainly not account for this, as the cathedral of Freiburg, in Breisgau, is remarkable for the wonderful state of preservation of its stonework, yet Freiburg is notorious as being one of the three places in Europe where the greatest amount of rain falls.

NORMAN DOORWAY, JEDBURGH.

We reproduce in our present number a drawing by Mr. G. H. M. Addison, of a late Norman doorway, from Jedburgh Abbey, a fine example of Transitional work. The ravages of time and weather have made sad havoc of the detail, leaving just enough to make us wish for more. During the revival of Gothic architecture, of which we are still reaping the benefit, all the periods received their due meed of attention except this, which may probably be attributed to the fact that it is essentially opposed to that economy in the stone-work so necessary in modern building. Perhaps no style is more suggestive to the designer in terra-cotta.

CASE FOR ORGAN: ST. MARTIN'S CHURCH, BRIGHTON.

This organ stands at a height of 18 ft. from the floor of the chancel. A recess, 15 ft. wide and 20 ft. high, is prepared to receive the frame, reservoirs, and heavier parts of the instrument, whilst the front shown in the drawing projects 6 ft. beyond the face of the wall. An effort has been made in designing the case to show the actual disposition of the various departments of the organ, and not to construct a mere screen of pipes and woodwork, having no relation to that which lies behind.

The "great organ," the diapason pipes of which show above the key-board to the right and left of the player, is divided into two parts, and projects to the full extent of the 6 ft. already referred to. This department is thus divided in order that the player may not be too much overshadowed by the projection, nor so much boxed in by solid woodwork as to be unable to hear what effect he is producing.

The carved panels which show between the pipes of the "great," and come immediately above the key-board, are kept back, and advance but little over the head of the player. The "swell organ" stands, at a little higher level, immediately behind the "great," and is hidden by the open panels already mentioned.

The "choir" organ projects, and forms the crowning feature of the design.

The "pedal" organ stands at the back of the recess, which is 10 ft. deep.

In building the church, preparation was made for placing the feeders and blower over the sacristy, and not in the recess with the organ itself. By this means the violent pumpings which so frequently occur are scarcely audible, and the danger from fire is lessened. The walls of the organ-chamber are constructed hollow, and a plastered ceiling stands above the instrument, only a portion of which is as yet erected. No part of the case is yet up, but the frame is prepared to receive it when funds permit. Messrs. Hill built the organ. Mr. Geo. Somers Clarke, jun., is the architect.

SCHLOSS BRÜHL, ON THE RHINE.

We present our readers this week with a view of the upper part of the principal staircase of Castle Brühl, a "cabinet piece of the Rococo style," that of Louis XIV. The ceiling especially is noticeable. Acting upon the impression that the slender Rococo ornamentation is not effective enough to divide the large horizontal space of the ceiling, and that a repetition of the frescoes in the three stories would be tedious under the treatment of that kind of painting, a gallery is formed at the summit of the walls, above which are introduced the final paintings at a height of about 14 ft. Powerful shades were thus produced. The castle was erected at the beginning of the last century, from the designs of French architects, for the Elector of Cologne. It is now the property of the German Emperor.

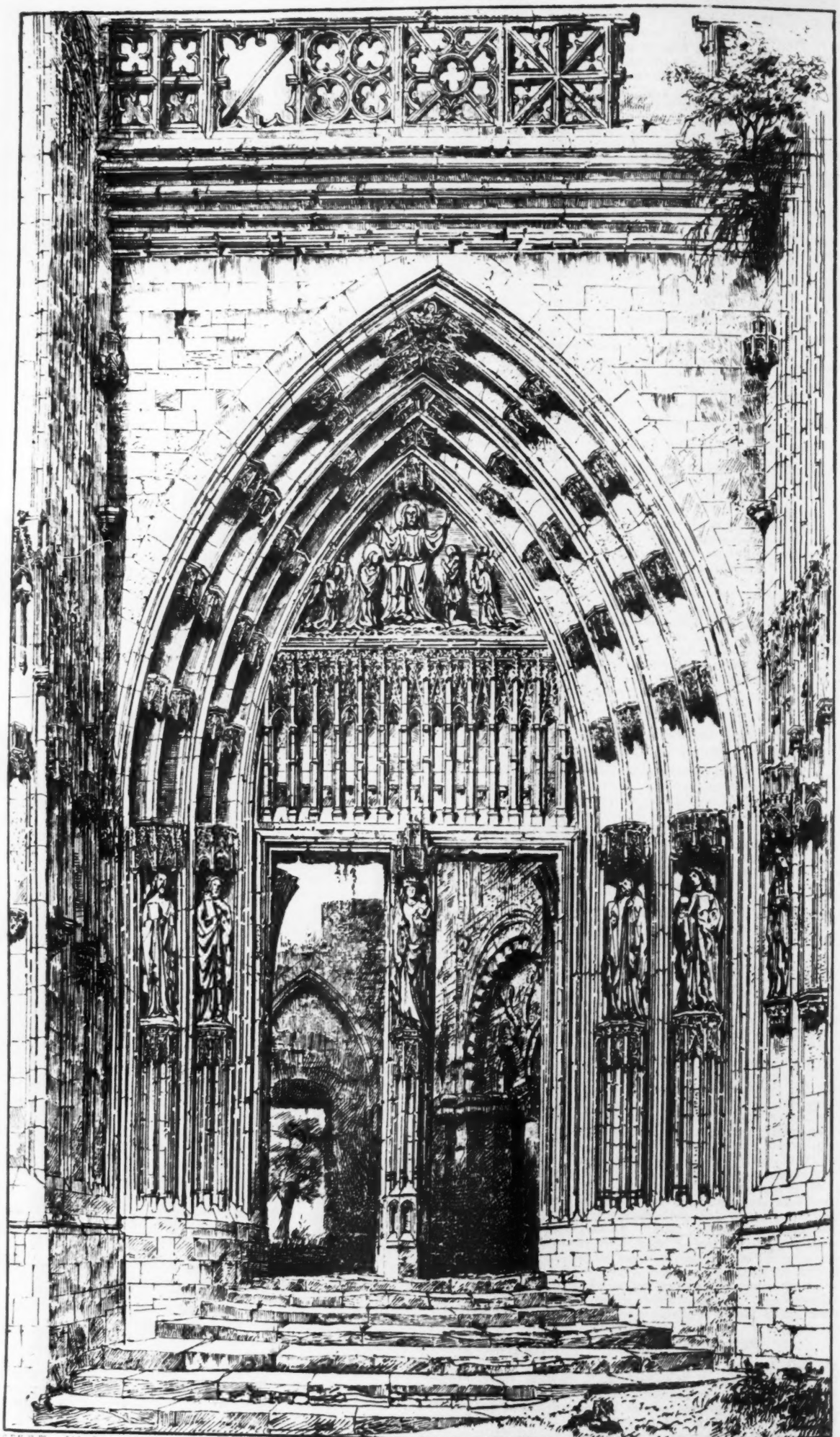
THE MANCHESTER AND LIVERPOOL DISTRICT BANK, SANDBACH.

This bank has been designed for an increasing population. The banking-room is entered by a commodious vestibule at the junction of High-town and Hope-street. A substantial angle-turret, the upper part of which is half-timbered, is the most prominent feature over the main entrance, the half-timber work being balanced by a pair of dormer gables on the front elevation. The main roof is hipped at each end, and covered with tiles. The architects were Messrs. Barker & Ellis, of Manchester, and the contractor was Mr. John Stringer, of Sandbach.

OFFICIAL INSPECTION OF HOUSES.

The Croydon Medical Officer of Health, Dr. Philpot, says in his last Report to the Local Board of Health:—"This arrangement of special inspections, which was instituted by your committee some few years ago, has worked very well. The number of householders who have applied for inspection of their houses shows how much the privilege is appreciated, and how many householders, alive to the dangers of defective houses, are glad to avail themselves of the assistance of the inspectors. Perhaps if it were more generally known that any occupier, by applying at the Sanitary Office, 8, Katherine-street, can have the sanitary arrangements of his house examined, without charge, by one of the Board's House Inspectors (who have now a very large experience), there would be still more applications. I have noticed that public companies have been formed for the purpose of inspecting houses, charging a fee for the examination. But it seems to me that the duty of house-inspection comes fairly within the duties of the public sanitary officers. One defective house may be a source of danger to the whole neighbourhood.

Station Roofs.—We understand that the walls of the Society of Engineers' meeting-hall in Westminster-chambers are covered with drawings of various recently-erected iron roofs in illustration of Mr. Arthur T. Walmisley's paper, which is to be discussed at their next meeting on November 7.



J. P. Kell, Photo-Litho, Castle St. Holborn, London, E.C.

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DOORWAY OF THE CHURCH AT WETZLAR ON THE LAHN.

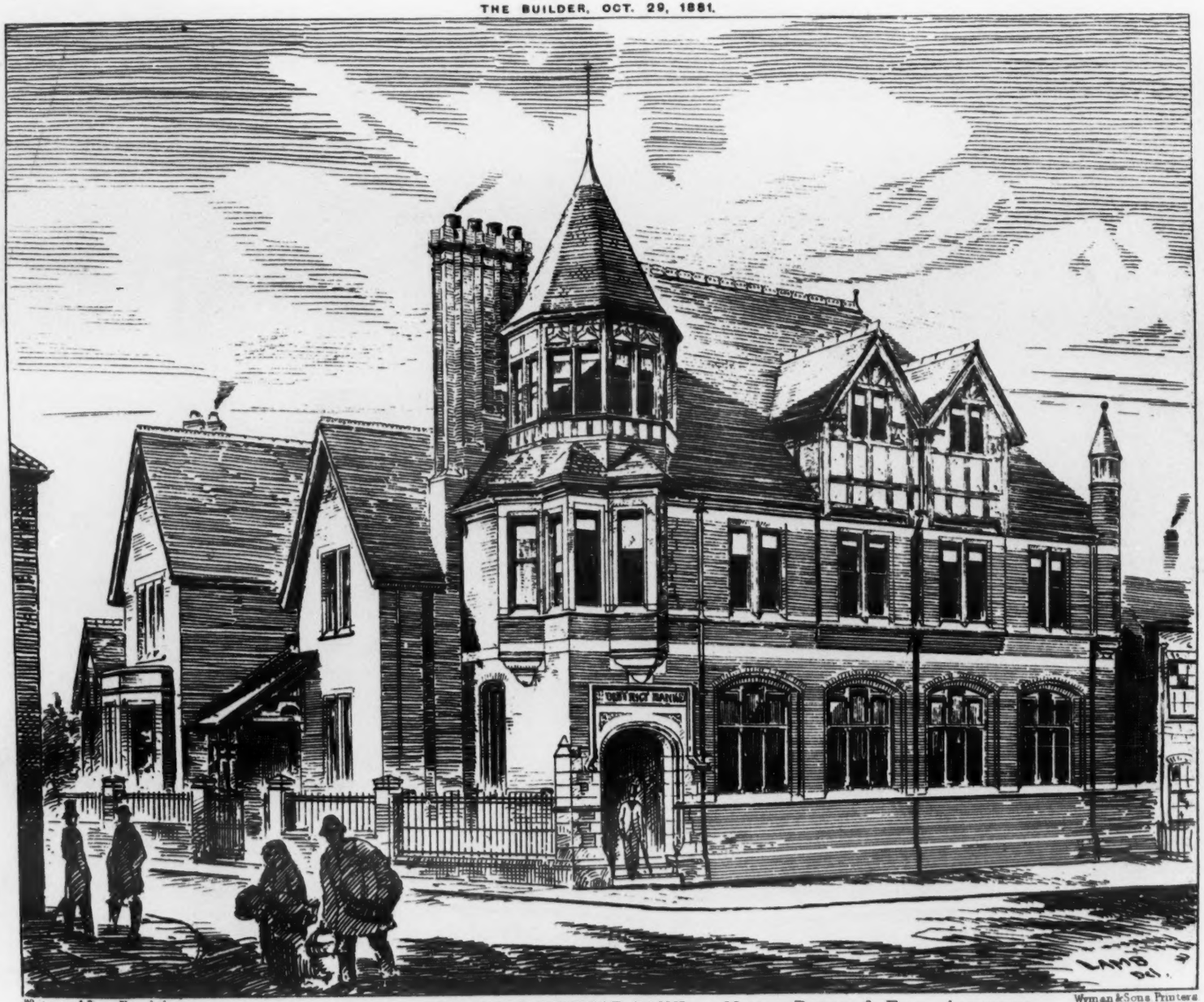
Whiteman & Bass, Photo-Litho 236 High Holborn

Wyman & Sons, Printers, Gt Queen St

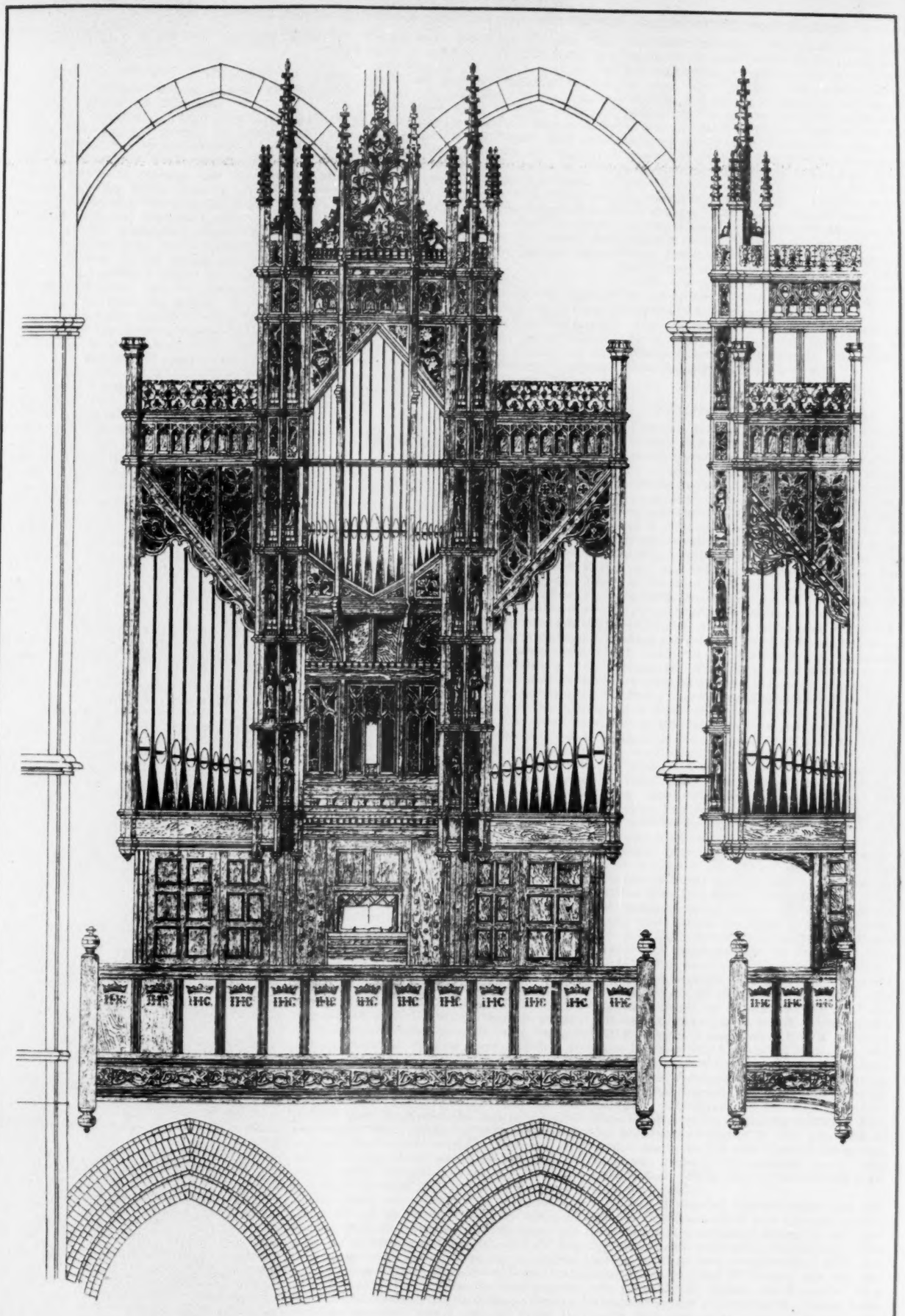
NORMAN DOORWAY, JEDBURGH ABBEY.

UPPER PART OF PRINCIPAL STAIRCASE, CASTLE OF BRÜHL, ON THE RHINE.

UPPER PART OF PRINCIPAL STAIRCASE, CASTLE OF BRÜHL, ON THE RHINE.



Whiteman & Bass, *Photo Litho* THE MANCHESTER AND LIVERPOOL DISTRICT BANK.—MESSRS. BARKER & ELLIS, ARCHITECTS. Wyman & Sons Printers



C.F. Kell Photo-Litho London E.C. Wyman & Sons Printers, 74 Queen St.

CASE FOR ORGAN, ST. MARTIN'S CHURCH, BRIGHTON.—Mr. George Somers Clarke, Jun., Architect.

INTERFERENCE WITH THE USE OF THE ELECTRIC LIGHT.

GLASGOW INSTITUTE OF ARCHITECTS.

At the fourteenth annual meeting of the Glasgow Institute, the President,

Mr. John Honeyman, F.R.I.B.A., in the course of his observations in moving the adoption of the report, said year by year new topics required their consideration. That which seemed to be more immediately pressing was the question brought formally before them by the Master Masons' Association regarding the measurement of mason-work, and there were other questions connected with contracting demanding attention. Moreover, there were questions of more general interest to the community on which they as a profession might be expected to express an opinion. At the present moment there was at least one subject of the kind which, he thought, should be taken into their most serious consideration without loss of time. He referred to the proposal of the Corporation to secure a monopoly of electric lighting in the city and suburbs. Unfortunately, at first sight this seemed a sensible proposal, and the great majority of men did not take the trouble to look at anything of the kind a second time unless almost forced to do so. In reality such a monopoly—like everything else bad in principle—would be found pregnant with most pernicious consequences. It should not be necessary to point out to a constituency which boasts of its Liberal principles, and its abhorrence of Protection in any shape, that the principle of a monopoly is bad; and yet it would seem that the citizens of Glasgow were prepared quietly to acquiesce, without one word of remonstrance, in the creation of a monopoly of the very worst description—obstructing the practical application of scientific discovery, and prohibiting the use—for that was really what it would amount to—of an invention of the greatest utility; the general introduction of which would benefit the public health more than the most costly sanitary scheme which had been suggested. The excuse, of course, was that the gas monopoly must be protected. But where was this new departure of their Town Council to end? If they made the gas bad enough they might find it as necessary to secure a monopoly of paraffin oil and put a shilling or two on the gallon. The thing was almost too absurd for serious argument. If we made a bad bargain of the gasworks we must bear the consequences, and our experience in connexion therewith should at least teach this, that science was not like a distinguished living statesman—she gives no rash pledges of finality. The electric light was the light of the immediate future, but who could tell what might be next, and next? and it would indeed need a very strong case to be made out,—a very urgent necessity, in short,—to justify the creation of an obstructive monopoly, in defiance of every sound principle of political economy. It would be out of place to say more on the subject now. With the view of quickening their interest in it, he would venture to give one illustration of how injuriously the proposal might affect their clients,—in other words, their fellow citizens. In a large block of buildings containing shops and counting-houses he purposed having a continuous elevator, worked by a small steam-engine, which should have sufficient surplus power to supply all the tenants with electric light. It was quite evident that the cost of the daily supply of light would be a mere trifle,—the engine and attendant being required, at any rate; and if it were supplied to the tenants gratis, much more than an equivalent would be obtained by increased rents and constantly occupied premises. Now, the question really came to be,—Is such an arrangement to be prohibited, because, forsooth, the Gas Committee must get 50*l.* of profit out of that property? Let them, he said, get their 50*l.* by all means; no one wished to repudiate their responsibility, but what he wished to point out was that the man who improved the annual value of his property by the free use of electric lighting, to the extent of say 300*l.* a year, even if he paid that 50*l.*, was a gainer by his freedom to the extent of 250*l.* Now, what the committee wished to do in order to secure this 50*l.* was to prohibit the intended economical production of electricity, and so, in effect, confiscate the 250*l.*; not to supply electric light at all for years,—as even the words of our progressive Lord Provost seemed to indicate; and when they did vouchsafe to allow it, the tenants would be left to the tender mercies of the Gas Committee, and most of them knew something of these. The supply would be connected with the house, not as the proprietor or the tenant wanted, but when, where, and how the officials of the Gas Office thought proper, who, after probably making a thorough mess of good walls and ceilings, would charge whatever they thought proper for their trouble. And lastly, they would charge whatever they chose for the supply of electricity, and interfere with the use of apparatus which the user might prefer, allowing no choice of accumulators, lamps, or anything else. Knowing, as they did, how such things affected property, he felt strongly that a certain responsibility rested upon them in the matter, and that it deserved their most earnest and immediate attention.

A meeting of the newly-elected Council (Glasgow Institute), took place immediately after the general meeting, Mr. John Honeyman was re-elected president; Mr. James Sellars, jun., vice-president; Mr. John Burnet, 107, St. Vincent-street, auditor; Mr. William Landless, treasurer; Mr. William M'Lean (of William & C. J. M'Lean), writer, 196, St. Vincent-street, secretary.

A NEW COUNCIL CHAMBER AT GUILDHALL.

At the meeting of the Court of Common Council, on the 20th inst., Mr. Fricker (chairman of the Special Guildhall Improvement Committee) brought up the report of that committee on the reference of March 31st, 1881, to consider the whole question of a scheme for the complete arrangement and improvement of the courts and offices in and around Guildhall. He said that the present chamber was utterly inadequate. There was accommodation for something like 130 or 140 members, whereas the number on the list was something over 200, and they were often inconveniently crowded, and had to breathe a very impure atmosphere. On March the 31st a reference was made to his committee to consider a scheme for the complete re-arrangement and improvement of the courts and offices around Guildhall. The committee did not at the present moment desire to recommend the Court to carry out any very extensive improvements; indeed, they refrained from expressing an opinion as to what sum of money might be afterwards required for carrying out that which was foreshadowed on the skeleton plan, and turned their attention to the construction of a new Council-chamber. What they recommended was simply the erection of a new Council-chamber on the north side of Guildhall, to occupy the position now occupied by the Court of Exchequer, the Chamberlain's office, the Town Clerk's office, and the Architect's office. The diameter of the chamber would be 54 ft., surrounded by a corridor 9 ft. wide, by means of which ready access would be obtained to every part of the chamber, and great facilities afforded for warming and ventilating the interior. The Lord Mayor and aldermen would, according to this design, enter the court from the dais at the eastern end of the Guildhall through an ante-room, the commoners' entrance being from the existing corridor. Sitting accommodation for all the commoners (206 in number) would be provided, the seats being arranged concentrically to the Lord Mayor's chair, and on a rising stage. Each member would have his own definite seat, as is now the case in the aldermen's court-room. Seats for twenty-five aldermen and the Recorder would be provided on a raised bench on either side of the Lord Mayor's chair; and for the principal officers, below and in front of the Lord Mayor. There would be a gallery round this chamber to accommodate about 300 of the public, and over the Lord Mayor's chair there would be a reporters' gallery. In the centre of the chamber would be a table for the exhibition of plans, papers, models, &c., and immediately opposite the Lord Mayor would be the City Seal and the Bar, as at present, with considerable additional space for petitioners. Adequate provision would also be made for taking divisions, the respective tellers being situated at a distinct point in either corridor, the members passing out right and left into the corridor, returning by the bar of the Court. As regarded the dimensions of the building, the external diameter would be 78 ft.; internal diameter, within screen, 54 ft.; the corridor, 9 ft. wide; internal height from floor to dome, 61 ft. 6 in.; internal height to top of lantern, 81 ft. 6 in.; and the external height to the vane would be 100 ft. The replies of the Architect as to the question of ventilation, which had had their serious attention, were entirely satisfactory. The Architect told them that the building, without the fittings, but including the permanent offices for the Town Clerk, which would be beneath the floor of the chamber, but level with the pavement in Basinghall-street, would be about 35,000*l.* If they fitted up the chamber with furniture and fittings of the same quality and description as in the library, the cost would be something under 2,000*l.* In order to carry out this plan they must remove some of the present offices, and provide temporary accommodation for the officers while the building was being constructed. The Architect estimated the cost of such temporary accommodation at about 1,200*l.* He moved that the Court agree with the committee in their report, and that it be referred back for execution.

The motion was carried amidst loud applause, and it was referred to the Coal, Corn, and Finance Committee to provide the necessary means for carrying out the work.

THE NEW DOCK AT SWANSEA.

The new east, or "Prince of Wales," dock at Swansea, opened by H.R.H. last week, is constructed in what was formerly known as Fabian's Bay, a large expanse of soft mud and shingle inside the harbour mouth, through which ran a channel, communicating with the ancient shipping place called Port Tennant. There was at first a good deal of controversy as to the advisability of doing away with so good a refuge for ships running into harbour before the wind as the soft bottom of Fabian's Bay, but that was overruled, and, by the Swansea Harbour Act, 1874, the construction of the present dock was sanctioned. The estimated cost was then 300,000*l.*, but that has since been reduced by leaving parts of the work, such as the walling and locking of the half-tide basin, temporarily incomplete. The area of water enclosed in the East Dock is 23 acres, which gives a length of 2,320 ft., a breadth varying from 500 ft. to 340 ft. and a depth of 36 ft. There is a slight difference of 2 ft. between the depth, from coping to bottom, on the north and south sides, because of the requirements of the coal drops. The outer cill of the lock will have on it 32 ft. of water in ordinary spring tides. This is one yard deeper than was originally contemplated, but the Harbour Trustees thought it necessary in order to provide for the ever-increasing size and draught of water of the class of steamers which now almost monopolise the carrying trade, and also in view of the further deepening of the entrance-channel by dredging. The inner sill of the lock will have a water depth of 27 ft. at ordinary spring tides. The length of the quay walls round the dock is about a mile. It was first intended to make a half-tide basin with entrance-gates in the usual way, but with a view of saving present outlay, and as the engineer (Mr. Abernethy) reported it would be no less efficient, it was decided that the basin should be for the present a tidal one. Its water area is 4½ acres, length 400 ft., breadth 400 ft., length of quay walls 1,000 ft. The lock is no less than 500 ft. long by 60 ft. wide, and has all the latest appliances. In this respect Mr. Abernethy has planned several modifications since he constructed the Alexandra Dock at Newport. The length of the lock quay wall from the dock to the tidal basin is 622 ft. Near the south-eastern corner of the new dock, or rather nearer to the lock than to the corner, has been prepared the entrance to a large graving-dock, 500 ft. long, which will be hereafter excavated.

By way of securing tranquil water just outside the tidal habour, and with a special view to prevent the prognosticated difficulties of entering when south-west gales are blowing, a fine horn or pier has been constructed of solid concrete, which projects 500 ft. into the sea, and will presently be backed and supported by a triangular stretch of earth-work, running backwards from the outer point to the adjacent copper works.

The total amount of excavation effected at the new dock is no less than 1,200,000 cubic yards. The work of excavation has been mainly done, and of course vastly accelerated, by the employment of powerful machinery and appliances. No less than fifty engines have been in use at one and the same time,—namely, five steam navvies or "devils," fourteen locomotives, twenty steam cranes, and eleven portable engines for

various other purposes, such as working winding gear, mortar-mills, &c. The masonry is chiefly of local Pennant sandstone, worked at the contractors' own quarries at Red Jacket; at Messrs. Thomas, Watkins, & Jenkins's Townhill Quarries, or elsewhere in the immediate district. No less than 40,000 cubic feet of granite blocks have been brought from the Penryn Quarries to form the coping stones, quoins, &c., and some portion of the lock. The bottom of the lock is lined with bricks, of which the round number of 500,000 has been supplied by the Mill Lands Brick and Tile Company, Neath.

The works have been kept dry by a pair of Cornish pumps, erected near the seaward entrance, and capable of lifting 1,600 gallons per minute. There are six lock-gates, each leaf of which weighs 70 tons. They have been built on the spot, of greenheart timber from Demerara, and pitch pine from America.

The new harbour railways, including seven miles of siding accommodation, with junctions with the adjacent Great Western Railway and Midland Railway lines, are progressing towards completion. The rails, which are wholly new and of steel, are supplied by the Dowlais Steel Company, and all the sleepers are well pickled. The whole of the coal-drops, capstans, gates, sluices, and other machinery in connexion with the dock will be worked by hydraulic power, the central point of which lies near the south-eastern corner, where a fine engine-house is constructed. This is being fitted with six great boilers and two engines, from the Elswick works of Sir Wm. G. Armstrong & Co.

None of the coal-drops are yet completed. There is space for the erection of five drops or tips on the Great Western Railway Company's wharfs, and three on the Midland Company's wharfs. All the foundations, &c., are ready, and most of the metal-work and other machinery is on the spot, but time has not allowed of their erection before the royal visit. The distinctive difference between the drops at the new and previous docks will be this, that at the New Dock the loaded trucks of coal will come down along the level railway to the tip, whence they will be lifted on the hydraulic platform to the height of the shoot, and, after being emptied, they will pass away over the high level. This exactly reverses the operation now in vogue at other docks in Swansea, where the full trucks occupy the high and the empties the low level lines. Under the new system, when the empty truck is discharged from the hydraulic lift on to the high level line, it will pass away by its own gravitation down a gentle incline, and thus save a great deal of labour.

The channel embankment, extending from the new cut to the east pier, is not walled, but sloped to the extent of 3 in 1, and faced with "slag" from the copper works. Around the dock, especially to the north and west, there is ample room for high and low level railways, drops, warehouses, sidings, &c.

As a backwater, the new dock has the waters of the Tennant Canal, which connects Swansea and Neath and other places by a thoroughly efficient system of water carriage. To the eastward of the dock, and extending for miles as far as the river Neath, there is a great deal of level uncultivated land, known as "the Bog," which affords ample space for the deposit of ballast and the erection of works, &c.

The consulting engineer of the Harbour Trust in the creation of this, as of the previous docks of Swansea, is Mr. Jas. Abernethy, President of the Institution of Civil Engineers. The work of carrying out his plans has been performed by Mr. A. J. Schenk, the resident engineer, Harbour Office. The contractor is Mr. Thomas Andrew Walker, of Cannon-street, London, whose resident general manager has been Mr. W. R. Parker, who has had for assistants Mr. Clifford and Mr. Conolly.

For the docks pure and simple, the contract price was originally 197,000*l.*, but was subsequently increased by 8,000*l.*

The *Cambrian* of the 21st inst. (to which journal we have been indebted in giving the foregoing account) contains some interesting details of the other docks of the port, of which Messrs. George & James Abernethy were the engineers. Telford reported upon the improvement of the harbour in 1827.

Beverley Waterworks.—These works are now fairly commenced. The first sod of the reservoir was lately turned by Mr. J. R. Pease, the Company's chairman. Mr. J. F. Fairbank, of Westminster, is the Company's engineer.

THE FISH-MARKET QUESTION.

Since our article of the 8th inst. on this subject was written, several other proposals besides those enumerated by us have been made. The three principal ones are the suggested acquisition of a large site in the Blackfriars-road (referred to in Mr. Leeuw's letter in our last, p. 530); the scheme propounded by Mr. W. J. Glenny, of King's College, in conjunction with Mr. A. T. Walmisley, C.E., for the extension of Billingsgate Market; and the scheme for a central market put forward by Messrs. Cayley and Boyes, in conjunction with Mr. H. H. Bridgman, architect.

The scheme propounded by Messrs. Glenny and Walmisley suggests the provision of a retail fish and fruit market, extending from London Bridge to the existing market at Billingsgate. It is proposed to widen Thames-street and to re-construct the whole of the existing warehouses and wharfs on the south side between London Bridge and Billingsgate, and to increase the height of them until the present rental is not only attained, but exceeded. The existing market covers about 31,350 square feet. The proposed re-construction, according to this scheme, would provide (its propounders say) an additional market of 72,710 square feet area, besides an increase of 1,000 square feet to the existing market, 7,200 square feet to the landing-stage, and 4,455 square feet to Thames-street. The retail and public entrance would be on the level of London Bridge. There would be continuous steam lifts for passengers, and hydraulic lifts and steam cranes for fish. In the additional width to Thames-street space would be gained to provide for sufficient cranes and lifts with convenient tramways to unload as many wagons as could occupy the space and convey the fish to auction stations on both levels if necessary. The expense of new approaches would thus, it is claimed, be saved, while ten times the quantity of fish could be unloaded in a given time.

The scheme with which Mr. Bridgman's name is associated is a bold one. It proposes the erection of a large market of two floors, 225 ft. wide and 940 ft. long, on the mud bank which covers the foreshore of the Thames on the Surrey side between Waterloo and Charing-cross Railway bridges. The superstructure would be supported on iron girders carried by three rows (running longitudinally) of iron columns resting on caisson foundations, the columns in the front row being 100 ft. apart. The whole of the columns would pass up through and support the sub-floor, and would, of course, also carry the girders of the principal floor, which latter would be covered in by an iron roof of one span, somewhat similar to that over the St. Pancras terminus of the Midland Railway. The principal floor of the market would be on the level of the roadway of Waterloo Bridge, and would have an area of 191,250 square feet, or 4½ acres. The east end of this floor would be approached from Waterloo Bridge. There would be a sub-floor at a level of about 25 ft. below this principal floor, and about 25 ft. above high-water mark,—thus permitting barges, &c., to pass underneath,—and this sub-floor would afford more than four acres of space available as standing room for fishmongers' carts and other vehicles. The proposed structure would project from the Surrey shore as far as the second pier of Waterloo Bridge, the frontage following the curve of the river. On the river frontage, on the level of the principal floor, would be a terrace walk, 25 ft. wide, supported by cantilevers, on to which terrace a long row of retail shops would open. The back elevation of the proposed market would be distant from the wharfs and business premises at present existing on the Surrey shore 60 ft. at one end and 100 ft. at the other end. With respect to the intervening space, which is now mud during about ten hours of the day, it is proposed to convert it into a deep-water dock or channel so as to allow barges to pass to or from the wharfs at any state of the tide. The immediate proximity of the proposed market to the Charing Cross branch of the South-Eastern Railway, which is on a level with the principal floor of the market, would allow of one or two short junction lines being made to run right into the market; and as the South-Eastern line is readily accessible from all the fish-carrying lines, fish by the train-load could be run into the proposed market, the plan of the principal floor showing four lines of rails running its whole length, with standing room for three lines of carts and vehicles between (in addition to a larger standing space in the centre of the market), so that the fish could be sold direct from the railway trucks and carted away at once by the purchasers. Provision could also be made for the landing of water-borne fish. At the west end, the proposed market could be approached by foot-passengers direct from the footway (which would be widened) of the Charing Cross Railway Bridge. Access for vehicles passing to and from the principal floor and sub-floor of the market is provided by an inclined roadway (with gradients of 1 in 18 and 1 in 20) from Belvedere-road. The chief access for vehicles to the principal floor of the market will be by two gateways opening on to a space between the east end of the market and Waterloo Bridge. These are the leading points of the scheme, which, as it appears to meet many requirements desiderated by those who have given evidence on the subject before a Committee of the Corporation, will no doubt receive due consideration. However pressing may be the necessities of the case, and whatever action may be taken by the Thames Conservators and other bodies with regard to the scheme, we must confess that the prospect of another enormous roof planted broadside on to, and some distance into, the river, is not likely to be agreeable to those who would not sacrifice everything to utility.

THE BISHOP'S DOWN GROVE SPA, TUNBRIDGE WELLS.

A number of gentlemen visited the picturesque and historicallly interesting locality, Tunbridge Wells, on Tuesday last, with the view of inspecting the additions and improvements that have been made at the Bishops' Down Hydropathic Sanatorium, and which render it a very complete establishment of its kind.

The first additions consisted of a handsome Turkish bath, comprising a spacious cooling-room, three hot-rooms, shampooing-room, all heated and ventilated on approved principles; a steam-laundry, engine-room, and boiler-house. These completed, the old mansion was stripped of its high-pitched tile roof, the walls were strengthened, and two stories of bedrooms raised thereon, and a large block of buildings was erected to the east of the old house. These latter contain a spacious dining-hall, 60 ft. by 35 ft., and 13 ft. high; a drawing-room 65 ft. by 33 ft., and of a similar height; and a recreation-room 48 ft. by 27 ft., having a well-arranged permanent theatre therein for amateur performances. There are two stories of bedrooms over the two large rooms, and the new kitchen is situated over one end, the dining-hall occupying the height of the two lower stories.

A wide and handsome corridor paved with encaustic tiles forms the old mansion or central block, as also leading from the grounds. All the corridors and passages are warmed by hot water at low pressure, as also the large rooms, the latter having, in addition, the ordinary open fireplaces. The kitchen offices have been fitted up with every modern appliance, so that the preparation and service of a dinner for 150 or 200 persons is a work of comparative ease. The additions have been carried out from the designs and under the superintendence of Mr. Benjamin Tabberer, architect, of Coleman-street, London. Messrs. Willicombe & Oakley, of Tunbridge, are the general contractors. Messrs. Benham & Sons, Wigmore-street, have executed the kitchen fittings; and Messrs. Weeks & Co., of Chelsea, the heating apparatus, introducing their Patent Caloric Batteries in the large rooms. The lifts are by Messrs. Waygood & Co., and the encaustic tile paving is by Messrs. England & Sons. The furniture has been provided by Messrs. Gillows, of Oxford-street, London, and both in design and solidity well sustains the reputation of that eminent firm.

The system of baths connected with the establishment is of a very complete character, and embraces all the latest appliances in hydrotherapeutics, including the electric baths, &c.

The proprietary have adopted the albo-carbon light for the illumination of the new *salle-à-manger*, the drawing-room, and the theatre or recreation-hall. In this system of lighting (which is at least remarkable for its simplicity) ordinary gas is employed, but prior to ignition is passed through ornamental vessels containing the albo-carbon material, the vapour from which so copiously reinforces the gas with carbon as to treble, if not quadruple, its illuminating power, and also renders the flames (which would

otherwise be yellowish and wavering) intensely bright and steady. One great advantage of this process is that the jets of gas in use are considerably reduced in number, with a proportionate decrease of heat.

The Albo-Carbon Light Company may be congratulated on having secured, through the enterprise of Mr. Dick and Mr. Young, and the taste of the architect (who supplied the designs), an excellent opportunity for illustrating the effects of their system.

The amount expended is said to be about 15,000*l.*

As a winter residence, the Bishops' Down Grove Spa offers many attractions to the invalid and to those who are desirous of breathing a purer air than is afforded by London and its immediate neighbourhood during the prevalence of the smoky fogs which envelope the metropolis for so large a portion of the year.

QUESTIONABLE ROAD-MAKING IN HACKNEY.

Some grave statements were made at a meeting of the Hackney Vestry last week, relating to the construction of Cazenove-road, Stamford-hill, which is at present in progress. Mr. W. J. Walker, one of the members, drawing attention to the subject, said that the manner in which the road was being constructed was a disgrace to the locality. He condemned the material which the contractor was using, stating that it consisted of the most offensive and deleterious stuff that could be conceived, and that the ratepayers' money was being wasted. He moved that in the opinion of the Vestry the present condition of the road, after having been six months in the hands of the contractor, and presumably under the superintendence of the surveyor, called for a searching inquiry into the present system of road-making in the parish. Mr. Butler, in seconding the motion, said the materials included pieces of old iron, old shoes, meat-tins, and other similar objectionable refuse, which had worked themselves up to the surface through the pressure of the traffic displacing the large boulders. The motion was ultimately adopted.

OPENING OF THE JOHNSON HOSPITAL, SPALDING.

Many of our readers will remember that in March, 1879, over sixty sets of competitive designs were received by the trustees, when the one selected was that of Mr. G. G. Hoskins, F.R.I.B.A., of Darlington (who has been successful in other hospital works already mentioned in our columns), shortly after which the work was placed in the hands of Mr. James Bulling, of Ollerton, near Newark, and has been carried out under the supervision of Mr. Wallis, clerk of the works.

On the 12th inst. the hospital was formally opened by the Bishop of Lincoln.

The aim of the architect has been, so far as externals are concerned, to present a building which, whilst in material construction corresponding with St. Peter's Church, to which it is adjacent, should at the same time bear upon the face of it evidence of its own all-important purpose; and, as to the interior, airiness, thorough ventilation, convenient ingress and egress, good lighting, and a favourable arrangement of aspects, have all been carefully studied and effected with the greatest possible success. The bricks used are of the same character and quality as those employed in St. Peter's Church; the eaves cornice, and other work of a like description, are formed of purpose-made bricks; the sills, copings, and other dressings are of Ancaster stone, and the entrance steps of Park Spring stone. All the external walls are hollow. The front of the building faces to the eastward, and on passing into the main entrance the first room that presents itself to one's right on the ground-floor is the operating-room, which is a one-story building, measuring 20 ft. by 16 ft. 9 in., and provided with ceiling-light and all the necessary convenience for surgical operations. Next in order in the front of the building is the surgeon's sitting-room (17 ft. 6 in. by 15 ft. 9 in.), from which only the main corridor has to be crossed in order to reach the consulting-room (16 ft. by 15 ft. 9 in.), and adjoining which is the surgery (16 ft. by 14 ft. 6 in.). Next in order come the dispensary and its attendant offices, all of which are so arranged as to afford the greatest possible comfort and the least possible inconvenience to those who may need the benefits of this department. The dispensary waiting-room is at the extreme north of the building, measures 24 ft. 6 in. by 19 ft. 6 in., and is fitted up with all the offices essential to a well-constructed dwelling, whilst to reach the dispensing-room (16 ft. by 13 ft. 6 in.), procure the requisite medicines, and pass out, the patients need but to pass along the main corridor, delay a moment at a hatchway provided for the purpose, and then make their exit by a door in the east wall. Ascending the main staircase, we find that all the wards are arranged on the first floor, occupying the extreme north and south respectively. Provision is made for twenty patients,—ten males and ten females,—the former being destined to occupy the north and the latter the south wards. The larger wards, which will accommodate eight patients each, are within convenient reach of two smaller wards, which will accommodate two patients each. Adjoining all the wards are the nurses' rooms. They are furnished with windows looking into both the larger and smaller wards, as also are the nurses' sculleries. The internal face of the walls of all the wards is finished in Parian cement; whilst the carpenters' and joiners' work throughout the building is of pitch pine, selected and varnished. Speaking-tubes are conveniently arranged to connect the various departments.

BATHS AND WASH-HOUSES FOR BETHNAL GREEN.

There is every prospect of Bethnal Green being shortly supplied with public baths and wash-houses. A special meeting of the Vestry was held last week to take into consideration the propriety of putting into force the Public Baths and Wash-houses Act. Mr. Jones, in moving a resolution in favour of establishing the baths, observed that the Act had been adopted in several parts of the metropolis, and in the majority of instances its effects had been of the most satisfactory character. In Whitechapel large numbers of the residents did their laundry work on the premises, the conveniences afforded being much appreciated. The Paddington baths cost 50,000*l.*, and notwithstanding this large outlay they had proved to be a paying concern. Bethnal Green had a toiling population, to whom a bath would be an appreciable luxury, but it was denied the people because there were none to be had, or otherwise they were in the hands of private persons who imposed almost prohibitory charges. The motion was referred to the consideration of a special committee.

A NEW STATION ON THE CRYSTAL PALACE RAILWAY.

For some time past building has been going forward on a large scale in the neighbourhood of Bushy-hill and Grove-park, Camberwell, some hundreds of houses having been erected in the locality within the last year or two. The residents in the district having represented to the London, Chatham, and Dover Railway Company that the two nearest stations,—Denmark-hill and Peckham-rye,—are both at a considerable distance and equally inconvenient, we understand that the company have determined upon the erection of a new station which will shortly be proceeded with. It is said that the new station will be placed about midway between the Denmark-hill and Peckham-rye stations, which will accommodate the large population which has recently sprung up in the locality.

PROPOSED NEW BUILDING ACT FOR THE METROPOLIS.

At the meeting of the Metropolitan Board of Works on the 21st inst., the Building Act Committee reported that, in their opinion, it is desirable that fresh legislation should be sought with relation to various matters appertaining to buildings and streets in the metropolis, and they recommended that the matter be referred back to them, to settle the details of the proposed measure, and that a reference be made to the Parliamentary Committee to give such notices and to take such steps as may be necessary to obtain legislation during the ensuing session of Parliament.

The recommendation was agreed to without discussion.

PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

4,367. S. E. Simpson, Birmingham. Dwelling-houses, &c. Oct. 7, 1881.

4,376. J. Carter, Uxbridge. Constructing and glazing roofs, &c. Oct. 8, 1881.

4,391. B. W. Spittle, Wednesbury. Attaching door-knobs to their spindles. Oct. 10, 1881.

4,423. W. A. Barlow, London. Slates. (Com by T. Finger, Coblenz, Germany.) Oct. 11 1881.

4,425. T. Stokoe, Headingley. Apparatus for heating rooms, greenhouses, &c. Oct. 11, 1881.

NOTICES TO PROCEED

have been given by the following applicants, on the dates named.

October 11, 1881.

2,539. M. Delmard, Plumstead. Chimney-top or cowl and ventilator. June 10, 1881.

2,686. A. Damman & A. Cassard, Brussels. Parquet flooring. June 20, 1881.

3,708. A. C. MacLeod, Shrewsbury. Floors or surfaces for skating upon. Aug. 25, 1881.

4,297. B. D. Healey, Brighouse. Asphalte apparatus. Oct. 4, 1881.

October 14, 1881.

2,561. C. H. Pennycook, Glasgow. Bars for holding glass for window and roof lights, &c. June 13, 1881.

2,629. G. A. Wright, Portsmouth. Materials for forming blocks for buildings, &c. June 16, 1881.

2,786. T. Carder, Chudleigh. Kilns. June 25, 1881.

3,839. C. D. Abel, London. Firegrates for burning dense fuel. (Com. by A. Godillot, Paris.) Sept. 3, 1881.

ABRIDGMENTS OF SPECIFICATIONS

Published during the Week ending October 15, 1881.

954. J. Taylor, Clapham. Paving-blocks for roadways, &c.

A piece of metal is driven into the upper part of the end of the wooden block, and may either be level with the upper surface of the block or raised a little above it, to give a foothold for horses, &c. March 8th, 1881. Price 6d.

1,025. J. Peer, Salford. Furnaces, fire-grates, &c.

Bars of an I shape are used, which, when placed together, form passages for air, which is afterwards admitted into the fire through the fire-clay back, and thereby the smoke is consumed. (*Pro. Pro.*) March 10, 1881. Price 2d.

1,026. S. Rideall, Manchester. Construction of buildings, &c.

In the construction of wooden buildings, planks are used for the covering thereof with grooves a short distance from each edge and on one side of the plank. These planks are laid a distance apart, grooves uppermost, and other planks are laid over them, grooves downwards, with the outer edges of the grooves resting in the grooves of the lower planks. (*Pro. Pro.*) March 10, 1881. Price 2d.

1,038. W. R. Lake, London. Water-closet apparatus, &c.

This is an improvement on Patent No. 4,037 of 1879, in preventing the escape of noxious gases and effluvia, and effects this object by a variety of improvements in details, which are stated in fourteen claims. (Com. by A. Edwards, Philadelphia, U.S.A.) March 10, 1881. Price 8d.

1,044. R. Douglass and J. Douglass, Coventry. Apparatus for the cure of smoking chimneys.

A box is fitted to the fireplace, the front of which is a sliding plate, in which plate are whirligig ventilators. The box is placed a little above the fire, and as the current of air enters the chimney it is whirled round by the vanes of the wheels, and meets and overcomes any down-draught. March 11, 1881. Price 6d.

1,047. C. S. Rolfe, Westminster. Appliances for preventing the efflux of gases from drains, &c.

This consists of various forms of traps. (*Pro. Pro.*) March 11, 1881. Price 4d.

1,051. F. Arnold, Birmingham. Hydro-carbon cooking and heating stoves.

In place of a single wick case, two or more are used, so far separated as to allow an adequate supply of air to reach the flames. A cone is arranged above the flames and an air-passage is slotted of sufficient width for both the flames, but so arranged that the combustion is perfected when placed under the draught of the chimney. March 11, 1881. Price 4d.

The Gale of the 14th inst.—Nearly 100 cases of dangerous structures were reported to the Building Act Office of the Metropolitan Board of Works, in consequence of the gale on the 14th inst., in connexion with which buildings, excepting in one instance, no loss of life occurred.

* Compiled by Hart & Co., patent agents, 28, New Bridge-street, E.C.

INTERNATIONAL COMPETITION FOR THE VICTOR EMMANUEL MONUMENT.

M. Otto Schulze, an architect resident in Rome who was present at the Museo Geologio Agrario, in the Viâ Santa Susanna, on the 22nd ult., when the last models were arriving in connexion with the above competition, states that 220 competitors had sent their works in by the afternoon of that day, and there were still a few more to be received. The city of Rome itself furnishes naturally a considerable number of the designs, viz., not less than forty. The exhibition of the entire collection will be opened in the middle of November. The maximum of 10,000,000 lire laid down in the conditions has been largely exceeded by not a few of the competitors, one of whom has sent in a design which would cost 100 millions to carry out. Most of the competitors, however, are within the sum allowed.

SEWER WORK AT BROMLEY.

Sewerage works are being carried out in Bromley by Mr. Potter, contractor, under the direction of Mr. Alfred Williams, C.E.; Mr. Garton, in the service of the Board at 3*l.* 3*s.* per week (appointed by the engineer), being the inspector. Serious charges are made against the latter to the effect that certificates have been given and moneys paid for work not done to a large amount,—the local *Telegraph* says to the extent of 1,000*l.* in concrete alone. A committee of the Board is investigating the matter, which has caused much excitement in the district.

SANITARY CONDITION OF THE YEOVIL PEASANTRY.

Sir,—Within the last few years the Yeovil Corporation has spent 30,000*l.* for a water-supply to the town. When the gentlemen composing that body decided to take that course, they had to deprive the river Yeo of part of that stream,—which, by the bye, had so often assisted in causing the floods on King's Sedgmoor. A certain noble landowner claimed the sum of 3,000*l.*, with costs, which the Corporation refused to pay. Consequently, a meeting was held before certain commissioners, at the Westminster Palace Hotel, where it is said the swearing and the rate-book widely differed. After all this hard swearing and enormous outlay of public money for the town, let us see the sanitary state of some of the houses. On the 15th of October I had occasion to pass by a place called Gore Knap, and the first thing that attracted my attention was a row of fifty-two houses, or rather hovels, with rooms about 10 ft. square, paved with broken bricks and stones, and filled in with dirt, from 6 in. to 10 in. below the level; some of the floors being 3 ft. 6 in. under the level of the path. In a rain-storm the water rushes in on these floors. Until three months ago there were only three water-closets; now there are two or three new ones put up, about 14 ft. from the front doors, which are public for any one. The only water-supply to these houses is that of a well 60 ft. deep, and yet they are not a quarter of a mile from the water-works, while the main pipe passes by them in suggestive proximity. There being but one w.c. to eight or nine houses, these poor people take it in turns to draw water out of the well in order to clear away the soil. This being by no means an easy or a pleasant task, it is often neglected, and then all sorts of disagreeable expedients have to be resorted to, such as ramming with broomsticks or pokers, clearing out with fire-shovels, &c. I saw two or three in a state quite unworthy of a corporate town like Yeovil, with its courts and boards and public officials. They were literally running over.

These houses have no gardens on which they can grow 5*s.* worth of vegetables. They are scarcely large enough to hang out the people's clothes,—those who have any. To see poor little children sitting about on the damp stone, brick, and mud floors looking as pale as death, their parents without money, fire, or food, is heart-rending. These houses are neither water nor wind tight. Many have as substitutes for beds a bag of straw, with scarcely any bed-clothing. Their food consists of potatoes and dry bread, and not half enough of that. The wages of these men are from 9*s.* to 12*s.* per week, and no work half their time. The poor women add a little to the miserable income by gloving,—say 1*s.* 3*d.* to 1*s.* 6*d.* per week. The best men are only offered 10*s.* per week for farm-labour when they are wanted.

I wonder whether there is any inspection of nuisances in this fashionable country town. I should like to know for whom between 30,000*l.* and 40,000*l.* were spent. I went into one house, where two families sleep in one of these small rooms. One poor woman, with seven children, was crying because she had no food to give them.

Sir, I cannot conceive any persons worse off in any part of Ireland; and yet in this very town there are charities which ought to bring in to the poor no less than 10,000*l.* per annum. The people of Gore Knap, Yeovil, told me that when they were fortunate enough to get a bit of land some had to give at the rate of 12*l.* per acre per annum for it. What will become of the poor of Yeovil during this coming winter is a puzzle to

G. Mitchell,
"One from the Plough."

P.S.—These houses are let on the average at 2*s.* per week. Many of the people never taste butcher's meat unless they chance to be in a club. The visits of the clergy are like angels' visits,—few and far between. Schooling is from 2*d.* to 4*d.* per week.

"THE VICTORY OVER SEWER GAS."

Sir,—I see by your foot-note to Mr. Mineard's letter that you are afraid of being inundated with letters on this unsavoury subject,—and with some reason, I think,—but I shall keep this as short as I can, and hope you will be able to allow it a corner, just to show that Mr. Mineard's system and the supposed necessity for ventilating *down* the soil-pipes rests upon a fallacy. Mr. Mineard writes of "the air current tending upwards, but always checked by the sewer-gas generated in the soil-pipe, which, *being heavier*, was trying to go down."

Is the sewer-gas generated in the soil-pipe heavier than air, and if so, why? It consists of a complex mixture of gases, none of which, except the carbonic acid, which is only present in small quantity, is heavier than air, and the sulphuretted hydrogen is very much lighter. Even if the gases were heavier than air at the same temperature, yet being generated by the fermentation of sewage they are heated by that same fermentation, and so are rendered lighter than they would be if cold. This is a point which is often overlooked with relation to carbonic acid. In many books on ventilation it is stated that, as the air expired by men and all animals consists chiefly of carbonic acid, and as carbonic acid is heavier than air, it will fall to the floor of a room and should be withdrawn there. Truly, carbonic acid is heavier than air *at the same temperature*, but the carbonic acid breathed from a man's lungs is at a temperature of nearly 100 degrees, and is therefore vastly lighter than the ordinary cold air of a room, and therefore rises to the ceiling. We all know the case of the monkey-house at the Zoological Gardens, which it was desired to ventilate on correct scientific principles, and without draughts. The question was, where should the outlets for the foul air be? The scientific (?) men said that as the foul air it was desired to get rid of consisted chiefly of carbonic acid, and as carbonic acid was heavier than air, the outlets should be at the bottom of the house. Accordingly, the builder made a row of outlets just above the floor, and none at all in the upper part of the house. It is not known whether any foul air ever did come out at these outlets,—probably it did when it had had time to get thoroughly cold, but the monkeys were all dead long before that.

I wonder that Mr. Mineard, who seems to be a practical man, has not detected the fallacy of his theory that the gas generated in a soil-pipe has a tendency to fall in that soil-pipe. The Engineer to our Association has, in the course of the last year, inspected hundreds of houses fitted with open soil-pipes and a proper intercepting trap with air inlet, and has always found that the air current was in at the inlet and up the soil-pipe. The engineer to the Edinburgh Association has found the same, and Dr. Alfred Carpenter, of Croydon has found the same. How could this be if the gas generated in the soil-pipe were heavier than the air?

I quite admit that in the majority of cases the current is a feeble one, because if the pipes are in a tolerably good state, no great amount of fermentation of sewage is taking place in them, and no great amount of sewer-gas is being generated. In some cases our engineer has reported that the current of air in at the trap was enough to "tear the hair off his head," but that has generally been when the soil-pipe was inside the house and in a warm position, or where it was outside and heated by the sun. I also admit that in such soil-pipes the air current is momentarily reversed when a flush of water is sent down the pipe, but this does no harm. A puff of air from the pipe is sent out at the air-inlet of the trap; but, in the first place, it does not often happen that anybody is standing over it just at the moment; and, in the second place, if the pipes have been well kept, and frequently and thoroughly flushed, he does not perceive any smell even if he is. After the momentary reversal the air resumes its usual course, in at the inlet and up the soil-pipe. I do not mean to dispute Mr. Mineard's "Victory over sewer-gas" at all. It is like using a steam-hammer to crack nuts. Nobody ever doubted that if he liked to connect an upcast-pipe with the foot of a soil-pipe, and burn a gas-jet in the upcast-pipe (or, still better, take it up a warm chimney), he would get a current of air down the soil-pipe, and it did not need Mr. Mineard to go "on a visit to the North" to find that out. I merely maintain that such an elaborate and expensive system is quite unnecessary; that the desired current of air can be maintained through drains and soil-pipes by much simpler and less expensive means; and that so long as there is a free current, the occasional reversal of the direction of it is not of the smallest consequence.

Cosmo Innes, M. Inst. C.E.,
Secretary London Sanitary Protection Association.

Sir,—The above title is scarcely warranted either by the facts as set out in Sir Henry Cole's letter of the 1st or by Mr. Mineard's explanations.

I am glad to find that the untrapped wastes from bath, lavatories, &c., existed only on paper, and these errors admitted there is much in the sanitary arrangements of the building I admire.

I take exception to the distance the sewer, or drainage, gas has to be fetched. Its success depends upon:—1. Gas constantly alight; 2. Tight joints; 3. Air inlets to servants' water-closet, or others close to, must be carefully proportioned to those which are remote from the heating chamber.

Mr. Mineard ridicules the idea of defective joints occurring, and also the cost of the gas consumed. The *Sanitary Engineer* of New York, October 1st, page 499, describes a defective soil pipe joint, which is not unknown this side the Atlantic; nor can the annual cost, representing a capital outlay of 50*l.*, be disregarded; the suggested ¾-in. pipe to servants' water-closet does not provide an adequate air inlet.

I agree with Mr. Buchan that "the forces employed are costly," and, if victory is obtained, a strong garrison must be left in charge of the fortress to watch the enemy.

A system which will give reasonable security, economically, and especially in a self-acting form, is, to my mind, much preferable.

I have since 1875 held on to the principle I have used at the Post-office here, which simply provides an air inlet inside the sewer trap, and the soil-pipe carried above the roof, surmounted by an exhaust cowl,—the method being now compulsory in those towns where the model by-laws, issued in 1877 by the Local Government Board, have been adopted. Some of the expensive traps and cowls afford additional security, but these details depend upon the length of the proprietor's pocket.

John Parker,
Borough Surveyor, Bridgwater.

The Birkenhead Borough Hospital.—Last week the Mayor (Mr. W. Laird) met the executive committee of this institution, at the hospital, for the purpose of formally handing over the extensions which have recently been made to the building. These additions were rendered necessary by the taking into use of another ward, not hitherto required. A second story has been added to the centre building, which contains four bedrooms for the use of nurses and servants. On the north side an annexe has been erected, containing a new operating-room, 18 ft. by 18 ft., lighted by three large windows and skylights, and approached from the principal staircase, between the ground and first floors. Below is a waiting-room for visitors, lavatories, and cloak-room, and in the basement large store-rooms. It will be remembered that the hospital was originally built by the late Mr. John Laird, and it is to the generosity of his son (the present mayor) that the town is indebted for the recent work, by which it has been considerably enlarged and completed. The contractor was Mr. Alexander Bleakley, of Birkenhead, and the whole of the work was carried out from the plans and under the superintendence of Messrs. Aldridge & Deacon, architects, of Liverpool. The cost of these alterations is about 1,000*l.*, the whole of which has been defrayed by the liberality of the mayor.

THE ARCHITECTURAL ASSOCIATION.

The opening *conversazione* of Session 1881–82 takes place this Friday evening, the 28th.

The syllabus of papers for the Session is as follows:—

Nov. 11.—Address from the President, Mr. Aston Webb.
Nov. 25.—"The New Examination, and what it involves." By Prof. T. Roger Smith.
Dec. 9.—"Barnacles." By Mr. Cole A. Adams.
Jan. 6, 1882.—"A Chat with the Younger Members on the Writing of Specifications." By Mr. Ewan Christian.
Jan. 20.—"Architectural Inconsistencies." By Mr. Philip E. Masey.
Feb. 3.—"The Treatment of Sculpture with Architecture." By Mr. Hugh Stannus.
Feb. 17.—"Physical Science in Relation to Architecture." By Mr. J. Slater.
March 3.—"Ideal Dwelling-Houses." By Mr. E. Ingress Bell.
March 17.—Members' *Soirée*.
March 31.—"Sundry Working Drawings." By Mr. J. P. Seddon.
April 21.—"Some Thoughts on the Principles of Design and Style in Church Architecture." By Mr. B. E. Ferrey.
May 5.—"Coloured Decorations." By Mr. G. Aitchison, A.R.A.
May 19.—"Markets." By Mr. John Hebb.
June 2.—"The Influence of Ritual on Church Architecture." By Mr. E. Eldon Deane.

COMPETITIONS.

Birkenhead.—Designs are invited in competition for a New Town-hall in Hamilton-square. A preliminary competition of sketch designs is open to all, and the authors of five of them will be selected to compete finally. Mr. Chas. Barry has been appointed to act as referee in both cases. The style of architecture is to be such as will harmonise with the adjoining buildings. Each of the five competitors will be paid 75*l.* towards his expenses, and the author of the design placed first will be employed to act as architect, and be paid the usual commission, 5 per cent. The cost is not to exceed 42,000*l.*

Oldham Free Library, Museum, and Art Gallery. The first premium (100*l.*) has been awarded, we understand, to Mr. Thos. Mitchell, architect, of Manchester, for design marked "F.S.A." The style adopted is Domestic Gothic, and the arrangement appears to meet all the requirements of the Town Council. The second premium (50*l.*) has been awarded to the authors of of the design marked "Practical,"—Messrs. Wright & Rawcliffe, of Burnley. There were twenty-six competitors.

East Looe Church.—The Committee for the re-building of the East Looe Church have received thirty-three designs. Almost from John o'Groat's to Land's End do the competitors hail. The 29th ult. was the last receiving day, the Committee meeting about a week later to view, and, if possible, select. Four designs were put aside, as being most suitable, to be sent to London for an architect to report on their respective merits, and to ascertain how far the condition as to cost had been adhered to by their authors.

Buenos Ayres Government Buildings.—The number of plans received by the Argentine Consulate in Hamburg for the competition of the new Government buildings at Buenos Ayres within the time allowed for sending in from German architects is no more than five.

SURVEYORSHIP ITEMS.

West Ham.—Mr. Lewis Angell, engineer and surveyor to the West Ham Local Board, has been awarded a honorarium of 200 guineas, with salary increased to 800*l.* per annum, without any interference with his private practice. Mr. Angell declined 1,000*l.* per annum with limitation to consulting practice.

Hereford.—For the appointment of City Surveyor, at 250*l.* per annum, one hundred and forty-nine applications were received, and the committee selected the following five gentlemen to attend a special meeting of the Council, viz., Messrs. J. Parker, Bridgwater, borough surveyor; T. Tylecote, Halifax, assistant surveyor; A. Holt, Beverley, borough surveyor; E. Kenworthy, Handsworth, surveyor to Local Board; W. L. Franklin, Reading, assistant surveyor. Ultimately Mr. J. Parker was elected.

West Sussex.—At the meeting of the West Sussex magistrates in connexion with the Michaelmas Quarter Sessions on the 20th inst., Mr. Thomas Skinner, of Horsham, was, on the recommendation of the County Highways Committee, elected County Roads Surveyor, at a salary of 100*l.* per annum.

OBITUARY.

Mr. Thomas Fraser, C.E.—The death is announced of this gentleman, who for some years has filled the post of Burgh Engineer for the city of Edinburgh. Mr. Fraser in 1855 entered the Burgh Engineer's office as principal assistant to the late Mr. Charles M'Pherson, whom he succeeded in 1872, after serving about six months as *interim* chief of the department. He was actively employed in carrying out the new paving and drainage arrangements provided for under the recently-passed Municipal and Police Act. About two years ago he was disabled by a complication of ailments, which eventually developed into consumption, under which he has succumbed. Mr. Fraser, who was about fifty years of age, died a bachelor.

THE NEW COMEDY THEATRE, PANTON-STREET.

Sir,—I am fully aware of your disinclination to publish complaints, but when the public safety is involved it is your duty to depart from such practice. The following words concern the new theatre (Royal Comedy), built under new laws and special superintendence for the protection of the public. Listen to my experience. Declining to add to the already high prices by paying an extra shilling (our theatrical extras are far too many) for booking a place, I resolved to go into the pit. Arriving some fifteen or twenty minutes before the doors were advertised to be opened, I found a crowd of about 100 persons had already assembled. I leave it to your imagination as to how many arrived during the succeeding fifteen minutes. At last a crack was seen between the double doors, which resulted in an immense and disagreeable compression of one's body. But no one appeared to advance towards the interior of the building. During that time I felt for those who were quietly, but not willingly, squeezed against the angles of the reveals of the doorway; but as no doubt they felt more than I fortunately did on that point, I turned my thoughts to my own protection. After some time, having undergone as nearly as possible breakage of my wrist, I reached the aforesaid crack, which turned out to be the partial opening of the doors, forming a kind of narrow funnel, just room enough for one person to get through sideways. Close to the edge of the door was the money-taker, at the top of some eight or nine stone steps behind the payer, who, had he stepped back 18 in. must have found himself falling down, and down which I nearly did fall, having found my poor feet, not recovered from being trampled upon, entangled in part of a lady's costume, how got there is easily guessed at. I may say here that the gallery-door appeared to me to be only a few inches from that of the pit; and no doubt the delighted "gods" were undergoing the same process of crushing, and, consequently, the two crowds must have been mixed up in the centre. Had the pressure burst open the pit-doors I should not have liked to have been among the first fifty, who would have been pushed down the stone steps.

Is this the result of the new laws for the protection of life and limb? If so, away with the laws and let the public seek to protect themselves. Is it possible that legal sanction has been given to such an arrangement? If not, how came the house to be opened? I suppose the laws impose a penalty for opening without a certificate; and unless the certificate is refused—which I saw was applied for last week—until the means of entrance be altered there must be an accident. I also perceived that a report was presented at the meeting of the Board of Works last week saying that two doorways at the Opera Comique had been widened and altered satisfactorily. Have those who have to report upon such cases inspected the doorways at the Comedy Theatre? The arrangement of the pit is bad. One gangway only down the centre; the seats (every alternate one with a back) running from this to the side walls, holding about thirteen or fourteen persons. Should the end person wish to go out, he has to squeeze past twelve or thirteen others before accomplishing the feat. I had to sit all the time with my toes only resting upon the floor, and even then the seat before me pressed most miserably against my shins. It was an impossibility to place my feet down flat. I also found that the spectators at the back of the pit could only see as high as the heads of those on the stage—my prospect was half way up the scenery, the ceiling under the dress circle being so low and oppressive. The ancestral shades of the ancient foot-lights are here in use. Some houses have improved on that ridiculous arrangement by having the lights below the stage floor. Of the other parts of the house I am not able to speak, not having yet visited them. The curtain is quite below criticism: a discredit to Messrs. Howell & James. This, Sir, is our improved London Theatre, built, as I have said, under new laws and special superintendence.

Y.

THE INSPECTION OF THEATRES, &c., IN THE METROPOLIS.

The Building Act Committee of the Metropolitan Board of Works, reporting to the Board at its meeting on the 21st inst. with reference to the question of the inspection of theatres and other places of public amusement in the metropolis, stated that the architect is authorised by the 21st section of the Metropolis Management and Building Acts Amendment Act, 1878, to enter and inspect such places, and they now recommended that the Assistant Architect be also authorised by the Board in writing, under their seal, to enter and inspect the same. This recommendation was agreed to.

THE DRAINS OF ANCIENT ROME.

Sir,—In your issue of the 8th inst., under the heading of "Sanitation in Ancient Rome," appears the statement that the Cloaca Maxima, constructed under Tarquinius Superbus, was a common sewer, and that it ranks with the best sewers of our times, as regards excellence of construction. This is a mistake. The Romans did not pour fæces into underground sewers: these were used exclusively for carrying off the storm water to its natural destination,—the river. It is a well-known fact that about fifty years ago corporate bodies seized upon and used water-drains for carrying sewage, and to this arbitrary and senseless act we are indebted for that great nuisance of our degenerate age,—gigantic sewers on the pernicious *combined system*,—the very worst extant.

Chas. Kroll Laporte.

UNPROTECTED CHURCHES IN EAST ANGLIA.

Sir,—I have read with interest the paragraph in your paper on this subject, in as far as lightning-conductors are concerned. There is another precaution which, however, is neglected, and that is the fire protection generally of the sacred edifices of this country. Most of the cathedrals have, certainly, hydrants, fire-engines, and at Canterbury Cathedral there is a "Merryweather" steam fire-engine, which will throw a jet of water over the pinnacles of the Bell Harry tower; but I think I am correct in stating that there are not a dozen churches that possess any means whatever of putting out a fire. Fires in churches increased during the last and severe winter to an alarming extent. Now a church is just the building where fire apparatus can be fixed with excellent effect and at small cost. Most churches have high towers or spires; in these should be fixed a tank with a main from tank to basement; two hydrants would suffice, one to command the organ-loft, and the other the vestry and body of the building. Water could be readily pumped up by means of a hand crank-pump in order to keep the tank full, and this need only be done four times a year in order to keep the tank free from foul water. Two hundred pounds on the architect's estimate would in most cases suffice to carry out the fire-extinguishing machinery in an effectual and workmanlike manner. There is more money-value damage done by fire to our churches than by lightning, and invariably the cause is the heating apparatus. There has been a law passed in Sweden to the effect that every church shall be provided with at least a London Brigade hand-pump, and my firm has already sent some hundreds to the churches in that country. In many of our old and valued churches there should be at least two hand-pumps,—one for the organ-loft and the other for the vestry, and a dozen fire-buckets,—the whole lot of which would not cost beyond 15*l.* to 20*l.* per building.

J. C. Merryweather, M.I.M.E.

DEFECTS IN HOUSE BUILDING.

Sir,—I took a house about a year ago, and have ever since been annoyed by a most unpleasant smoky smell. Sometimes smoke comes through the floor of my basement passage in volumes, but usually there is nothing visible, merely an unpleasant smoky smell pervading the whole house more or less. The house is very badly built, and the party walls are quite hollow. There are, I fancy, cracks both in my own and my neighbour's chimneys through which the smoke finds its way into the party walls, and from thence gets into the rooms. My landlord sent some men who pulled up the flooring and plastered the walls between the joists and the ceilings, with the result of making matters rather worse on the whole.

What I am anxious to know is whether any architect or builder among your readers has had a similar case to deal with, and has dealt with it successfully. If so, I should like to be put into communication with him.

E. K. Hervey.

HYDRAULIC DIFFICULTIES.

Sir,—In your issue of the 8th inst. "Greenhorn" desires some information on the subject of "Hydraulic Difficulties." I think a good way of getting over his trouble will be to sink an iron cylinder in the well with a solid bottom. It would be somewhat expensive, but most effective. J. C. M.

EXPERIMENTS ON TRAPS.

Sir,—I was somewhat surprised on reading a letter in your issue of to-day signed "P. J. Davis," in which he states that the action of the "Eclipse" trap is the same as that of the "O." Now, in the face of the experiments made at the lectures to which P. J. D. refers, and at which I know he was present (as I saw him there), by Mr. J. Stevens Hellyer, in which it was shown clearly enough that the "Eclipse" trap was not siphoned, either by the momentum of the water or by the siphonage set up by the action of the same, whereas the O trap was completely emptied, I marvel that he should risk his reputation as a practical man by making such an assertion, and I must say I am extremely sceptical as to the alleged result of the experiments conducted by Mr. Pullen, and as to the originality of the improved trap mentioned. P. J. D. appears to be eating his own words, as it was only the other week that I read a letter of his in a trade contemporary on the "Eclipse" trap extolling its virtues in every way. James Rankin.

*** Since the above was in type, we have received notes from Mr. John Smeaton, Mr. Daniel Emptage, and others, challenging the statement made by Mr. Davies, but we cannot find room for them.

Books.

Modern Architectural Designs and Details. New York: W. T. Comstock. London: Trübner & Co. 1881.

This book, which, like a good many architectural publications which reach us from America, has no author's name on the title-page, is a collection of what would be called, we presume, model plans and designs in domestic architecture, chiefly for country-houses. The production of a book of this class in England is usually the work of an architect who brings it out on his own responsibility; in the United States it seems to be generally a speculation of a publishing firm, and apparently intended to provide designs for those who wish to be their own architects, or, at all events, to have a certain "say" to their architect in regard to the design and construction of their house. This book differs from some other American publications of the same class in that the designs are the work of architects whose names are given in each case, and comprise, we are told, "original drawings made by a number of prominent architects of different localities, prepared expressly for this work." We are not sufficiently acquainted with the prominent names in the profession in the localities referred to to know what their status in their own neighbourhood is; but the plans, views, and details are evidently the work of practised hands, and the whole are very well and carefully drawn, the book in general showing a much superior stamp of workmanship to that of many American architectural works that have been sent to us.

The general style of the houses shown exhibits more or less the influence of the new English taste in domestic architecture, though with a larger admixture of woodwork in the exterior design, and but little of the cut brickwork which is so much the fashion among us at present. The method of execution of the drawings does not, however, distinguish material very well. From the marking of the elevations it is evident that some of the houses are finished externally, for a part of their height, with tiles or shingle, with generally the ground-story of either brick or stone. The system of dividing the upper portion of the windows into very small panes, leaving the lower portion nearly clear, has evidently established itself on the other side of the water, and is introduced in almost every design.

It is difficult to say exactly what it is which prevents these designs from appearing inviting to the English architect's eye. The style of drawing, though most commendably neat and finished, is not such as to make either elevations or views effective, and it is possible that some of these houses may look a good deal more interesting in execution than they appear on paper as here drawn. But making allowance for that, there is a deficiency which we feel at once in turning over the book; a want of feeling for the picturesque side of architecture, whether considered in mass or in detail. This is the more apparent, because the intention obviously is to be picturesque, and some of the buildings, *e.g.*, that on Plate 45, "House at Short Hills, N.J.," are prettily grouped in regard to disposition and skyline. But there is a kind of prim character about the whole which results, perhaps, from the deliberate attempt to imitate the manner and style of houses of the Old Country without any innate sympathy with it. If the architects who made these designs are trying to give the old English house over again, they have not succeeded, and they would, perhaps, have done something a good deal better if they had looked less to precedents which they have not the genuine instinct for. The interior wooden details are all very carefully drawn, and with a desire to do what is in good taste, nor is there much in them that can be said not to be so, but there seems a very great sameness and want of invention in them. The best treatment in detail is in the drawings of the house at Fairmouth, N.J., by Messrs. Rossiter & Wright, Plates 65, 66, 67. The architecture of the house is exceedingly simple, but there is a distinct character about it, and the treatment of the woodwork is in very good taste. Throughout the volume the wooden details are usually what is suitable to wood, and so far are in good taste, but they seldom get beyond deserving just that praise and no more. The constructive details of the woodwork are carefully and minutely given, and generally the woodwork is well put together, though in some of the external woodwork there seems a deficiency in throating and other such precautions against weather. The specimens of perforated ornamental brass panels for ventilating openings, given at the end of the book, seem far too naturalistic for design in this kind of work: they should be more flat and conventional in type.

We looked over the plans with some interest to see if there were any points in house-planning that could be noted as suggestive or differing in any important points from general practice here. We observe that in nearly all the plans a "china-closet" contiguous to, and in most cases opening directly out of, the dining-room, seems to be considered an essential; in one case it is called "butler's pantry," and as, in another case, there is a sink shown in it, we presume it answers to what we shall call the butler's pantry here; but it is much too close on the family dining-room for our notions. A merit which may be noticed in the plans generally is a considerable variety and picturesqueness in the shape and proportions of the sitting-rooms,—more, on the average, than we generally find in English houses, where we run so much into respectable parallelograms in our sitting-rooms. In one house designed for the sea-side, instead of a dining-room there is a "dining piazza," a large extended verandah, in fact, for open-air dining; a good feature in a hot climate, but one which English sea-side weather would leave us little chance for here. We observe that in nearly all the plans the w.c. and bath-room are in the same apartment, a most objectionable arrangement, long since discarded in all well-planned English houses, and quite unworthy of the refinement of civilisation to which in matters of domestic life the Americans have attained. We can scarcely imagine that this represents the usual arrangement in good American houses, even on a moderate scale; but if it does, it should be altered.

To country-builders and proprietors who are unable to obtain the assistance of an architect, the book will be useful.

Miscellanea.

Church's Joint-maker.—We are not disposed to think that the method of joining leaden pipes patented by Mr. Church, and illustrated n our advertising columns, is likely to supersede the ordinary mode of "wiping" by hand, but under certain circumstances we have no doubt that it may be advantageously used. As our readers may have noticed, it consists in the provision of boxes, or moulds, of various sizes, so arranged that a joint may be cast, and any intelligent workman, duly reading the instructions, can, in the absence of a plumber, do this. In some cases, moreover, pipes are so shamefully ill-placed that it is not possible to make a fresh joint in the ordinary way, and then, as it seems to us, Church's method might be adopted with advantage.

The New Town-Hall at Huddersfield, which has cost nearly 40,000*l.*, was formally opened on the 18th inst.

A Technical School for Huddersfield.—The memorial stone of a building which is being erected in Huddersfield for the purpose of a Technical School, was laid on the 19th inst. by the Master of the London Clothworkers' Company. For some time the demand for technical instruction in Huddersfield has been continually increasing. So far as was possible this demand has been met by the Mechanics' Institute, with which the new school is to be associated, but the means at disposal were found to fall short of what was required, and steps were accordingly taken to extend the range of operations, which up to the present have met with great success. Subscriptions to the new building, which will cost about 12,000*l.*, have been given liberally. It is worthy of note that the funds have been chiefly contributed by the residents of the town and surrounding districts, aided by a grant of 2,000*l.* from the Clothworkers' Company. The subjects intended to be taught comprise pure and applied mechanics, machine and building construction, chemistry, especially as applied to dyeing, scouring, and bleaching; experimental physics, embracing light, sound, heat, magnetism, and electricity; mechanical drawing, and its application to machine and building construction; pattern designing, and its practical application to the loom, and other branches of the textile trades; and such other subjects in primary, technical, and industrial education as the council may from time to time think necessary. Mr. Edward Hughes is the architect of the new building.

The Forthcoming Health Congress at Brighton.—Brighton is looking forward with much expectation to the Health Congress and Sanitary Exhibition, which is to be held in the Royal Pavilion in December next (from the 12th to the 21st). The Mayor-elect (Mr. Alderman W. H. Hallett, F.L.S.) is taking an active interest in the affair. He is supported by an influential committee, and the arrangements are being made upon a very extended scale, with good promise of success. Dr. B. W. Richardson will deliver the inaugural address at the Congress, and we believe that a special feature in connexion with the exhibition will be the erection of a number of artisans' model dwellings in the grounds of the Royal Pavilion. There will be eight sections or classes, of which Class III. will include house sanitation and hospital construction and appliances; Class IV. will be devoted to industrial dwellings; and Class VI. to house decoration and fittings. The exhibition will include a loan collection of works of art from South Kensington. Mr. William Hamilton is the honorary secretary. Intending exhibitors should apply early for space.

Party Walls.—An application for an injunction to restrain Messrs. Cow, Hill, & Co., of Bread-street, Cheapside, from pulling down a party-wall was heard before a Divisional Court of the Chancery Division, consisting of Mr. Justice Cave and Mr. Justice Kay. The Union Assurance Society, who are now in possession of the next house, which was partly damaged by the late fire in Cheapside, are reinstating the buildings, and have received notice from the Commissioners of Sewers to repair the party-wall. This they have done. The defendants have received a similar notice, but instead of repairing they commenced to pull down, and, according to the affidavit on which the motion for an injunction was made, this was being done for the purpose, not of repairing the wall, but in order to put up larger buildings. The Court granted an interim injunction over the 2nd of November to restrain the further pulling down, on the managing director of the Union Assurance Society giving an undertaking to be liable in damages.

Conder's Bible Hand-Book.—We understand that a third edition of this work, reviewed in our columns on its first appearance in September, 1879, is in the press. It is, perhaps, without precedent in the case of any work dealing with Biblical subjects, for the authors to have received, as has been done in the present case, high tributes to the value of their work from an English Primate, a Roman cardinal, and a Jewish Chief Rabbi.

Value of Land at Fulham.—On Tuesday last Messrs. Driver & Co., of Whitehall, sold by auction, at the Mart, Tokenhouse-yard, some small detached plots of land in Crown-road, Munster-road, and Margravine-road, containing together 2 acres 3 roods and 10 perches, which realised a total sum of 4,840*l.*, or at the rate of about 1,720*l.* an acre.

The Camberwell and Peckham Improvement.—At the meeting of the Metropolitan Board of Works on the 21st inst., the Works and General Purposes Committee submitted plans of additional widenings in the main thoroughfares of the Camberwell and Peckham improvement, at an estimated total cost of 8,600*l.*; and recommended that the same be approved and adopted, and that the said thoroughfares be widened to the extent shown upon such plans,—*i.e.*, from 50 ft. to 60 ft. in certain parts. Mr. Dresser Rogers, in moving the adoption of the report, pointed out that the thoroughfares affected formed a main artery of traffic to an exceedingly crowded and rapidly-increasing district of the metropolis, for whereas by the census of 1871 the population of Camberwell parish (which includes Peckham) was 111,000, and the number of houses 17,000, the census of this year showed the population of the district to be 187,000, and the number of houses to have increased to 27,000. Mr. Rogers incidentally stated that some of the building frontages already let by the Board on the line of the widened thoroughfare had realised four times the rental anticipated, and it was the opinion of the Superintending Architect of the Board that the proposed extra widening of the thoroughfare would still further enhance the value of the building frontages, and that the Board would be recouped to a far larger extent, *pro rata*, by the letting of building frontages than had been the case in any other improvement. The recommendation of the committee was agreed to by a large majority.

A Year's Building in Edinburgh.—At a meeting of the Guildry of Edinburgh, on the 21st inst., Mr. R. Hutchison was re-elected Dean of Guild. He subsequently submitted a statement as to the business of the Dean of Guild Court for the past year. It appeared that the number of applications for warrant to erect buildings, and to execute additions to, and alterations on, property within the jurisdiction of the Edinburgh Municipal and Police Act, 1879, was 466. This included applications by the Procurator-Fiscal against parties proceeding with work requiring warrant of the Court without such, and against proprietors of property in danger requiring immediate steps for their safety to be taken. Of these applications, 440 warrants had been granted, including thirteen for fines and costs against wrong-doers. The warrants granted were for two churches, 102 villas, 113 tenements of shops and dwelling-houses, and 334 alterations and additions, with hall, conservatories, &c.

Edinburgh Health Society.—This is the title of a society of which the inaugural public meeting was held on the 21st inst. Its object is the promotion of the laws of health in Edinburgh and the vicinity. Treasurer Harrison, in moving a resolution, said he regarded the Town Council in a great measure as a Health Society; and related what had been done by the operations of the Improvement Trust in improving the health of the city, the death-rate having been reduced from 26 per 1,000, at which it stood in 1863, to 20 per 1,000. Typhus fever, he was glad to say, was now no longer epidemic among them. Dr. Walter C. Smith, in seconding another resolution, referring to the work of the Improvement Trust, remarked that they had still too many dark, airless closes in Edinburgh, and many houses which were not fit for human habitation. There was still a heavy burden of shame upon the city that there were so many of such houses, and that they were occupied by their fellow-citizens.

Typhoid Fever, with a fatal result, having been generated by the unsanitary condition and overcrowded state of the Exeter Post-office, the Sanitary Authority desired to inspect the establishment, in order that they might direct the necessary steps to be taken to improve the condition of the building. The Postmaster declined to permit the entry of the authorities, but yielded when a magisterial order was presented. The state of affairs in the telegraph department was so bad that the Town Council pronounced the building to be dangerous to the health of the city.

The Royal Albert Hall Choral Society.—The Season will commence on Wednesday, 2nd November, with a performance of Handel's "Judas Maccabæus," when the Orchestra will again be increased by the band of the Coldstream Guards. Mendelssohn's "Elijah" will be given on the 23rd November. Sullivan's "Martyr of Antioch" and Berlioz's "Faust" are to be performed.

Civic Banquet to the Royal Academy.—On Wednesday evening the Lord Mayor and the Lady Mayoress, in accordance with the annual custom, entertained at dinner in the Egyptian Hall, Mansion House, the members of the Royal Academy of Arts. The Lord Mayor, in proposing "The Members of the Royal Academy," expressed his regret at the absence of Sir Frederick Leighton, the President, and associated with the toast the name of Mr. Street, who, after dwelling upon the great value of the exhibitions of works of old masters at Burlington House, alluded to the difficulty the Academy still found in prevailing upon the owners of such valuable works to part with them, even for a time. Turning then to the unseen work done by the Royal Academy, of which little was known by the public, he briefly described the schools of the Academy, in which masters, models, and casts were provided, and some 400 students were at present receiving instruction. They were taught by competent masters, and were visited by twenty-three visitors elected by ballot from among the members of the Academy. Thus the students were brought into intercourse with some of the most distinguished artists of the day. Referring to Blackfriars Bridge, and certain works contemplated at the Guildhall, he expressed a hope that when the architect had done his part, the sculptor and the painter would be called in to complete the decoration of the structure. He hoped that the arts of architecture, sculpture, and painting would be so cultivated in this City that in future years people might think of London as they now thought of the old centres of civilisation and art elsewhere in Europe. The toast of the Royal Scotch Academy was responded to by Sir Daniel Macnee, and other toasts followed.

A Cathedral for Liverpool.—In his primary visitation charge, delivered on the 19th inst., the Bishop of Liverpool said,—The third chief want of the diocese of Liverpool is one which I feel great difficulty in handling. I refer, of course, to the want of a cathedral suited to the size and wealth of our diocese, and to the importance of the second city in Great Britain. I approach the subject with delicacy. It is a far wider and deeper one than most people suppose. I am often asked, "When are you going to begin your cathedral?" But few seem to realise what the idea involves. Let us consider well what we are talking about. Let us count the cost. We must remember at the outset that in this matter the new diocese of Liverpool starts at an immense disadvantage compared to every new diocese of modern times. We have everything to do from the very beginning. We have not a church in our city which is fit to be converted into a cathedral. We have no site for a new cathedral, except one behind the Gymnasium, in a disused cemetery, which many, perhaps, would dislike; and any other site would cost an enormous sum. The cathedral itself, to be worthy of Liverpool, would cost a quarter of a million before it was finished. If any one comes forward with a princely offer like that of the ladies who have built Edinburgh Cathedral,—or if any one will do in Liverpool what has been lately done at St. Patrick's and Christ Church Cathedrals in Dublin, or at St. Finbar's in Cork,—I shall be deeply grateful. For anything I know, it may be in the heart of some one even now to do this.

Building in the United States.—Judging from an announcement recently issued by the Bricklayers' Union in New York, it would appear that the demand for labour in the United States is unusually keen. The Union gives notice that its members are to cease work henceforth at all establishments which are not paying a minimum of four dollars a day. In some cases, it is said, as much as five dollars a day, or over six pounds a week English currency, has been paid to workmen. The rise in the rate of wages, it appears, has proved a serious misfortune to the great building firms who have large outstanding contracts to perform.—*Daily News.*

Solomon's Temple.—It is reported, says the *Times* correspondent, that the Sultan has given orders for the remains of Solomon's Temple to be restored, and the surrounding place to be cleared of all rubbish. On that place stands the Mosque of Omar, the revenue of which is said to amount to 150,000*l.* a year. Hitherto this sum has always been forwarded to Constantinople, but for the future it is to be appropriated for the above-mentioned purpose. This act of the Sultan is believed to be a result of the visit of the Crown Prince of Austria to Jerusalem.

The Rhind Lectures in Archæology.—Mr. Joseph Anderson, Rhind Lecturer in connexion with the Society of Antiquaries of Scotland, delivered the opening lecture of this year's course in the Freemasons' Hall, Edinburgh, on the 17th inst., taking as his subject "Scotland in Pagan Times." The second lecture, delivered on the 20th inst., was on "Viking Burials." The third lecture, given on Monday last, treated of "Celtic Art of the Pagan Times."

TENDERS

For schools, Higham, for the Walthamstow School Board:—

Hawkins	£6,091 0 0
Bentley	6,035 0 0
Fuller	5,898 0 0
Angard	5,790 0 0
Read	5,700 0 0
Scott	5,549 0 0
Higgs	5,455 0 0
Goode	5,309 0 0
Palmer	5,280 0 0
F. Higgs	5,148 0 0
Beale (accepted)	4,777 0 0
Vernon & Ewens	4,490 0 0

For additions to Blood Hills Farm-house, Somerton, near Great Yarmouth, for Mr. F. Charsley. Messrs. Bottle & Olley, architects:—

R. Davey, Yarmouth	£452 0 0
J. Harbord, Caister	420 0 0
W. Wilson, North Walsham	392 10 0
R. Bartram, Aylsham	383 10 0
J. Bachelor, Stalham	364 0 0
J. H. Want, Yarmouth	356 0 0
T. S. Cooper, Yarmouth (accepted)	328 0 0

For deep well, pump, &c., to the above:—

Norman & Son Yarmouth (accepted)	£46 0 0

For new lodge, &c., at Flixton, near Lowestoft, for Sir Savile B. Crossley, bart. Messrs. Bottle & Olley, architects:—

J. & B. Swatman, Lowestoft	£530 0 0
A. Bedwell, Lowestoft	445 0 0
J. Rounce, Blundeston (accepted)	411 1 0

For house and premises in the Bulmershe-road, Reading, for Mr. Thos. Wilson. Mr. William Simmons, architect. Quantities by the architect:—

Poffley, Queen's-road	£1,295 0 0
Wernham, Princes-street	903 18 0
Bottrill, King's-road (accepted)	898 0 0

For fitting up Balham Institute, Balham New-road, as a mission-hall, for the Rev. Thomas Bates, vicar of Balham:—

T. Potterton (accepted).

For converting stable and coach-house in Pickett-street, Balham, into a mission-hall, and fitting up same, for Mr. S. Cawston. Mr. A. Cawston, architect:—

T. Potterton (accepted).

For additions to Seamen's Infirmary, Ramsgate. Messrs. Hinds & Son, architects:—

Smith & Son	£348 0 0!
Forwalk	247 0 0
Elgar	155 0 0
Home	155 0 0
Martin	142 0 0
Duckett	134 0 0
Miller (accepted)	123 0 0!

For the erection of two semi-detached villas at Heme Hempstead. Mr. Walter T. Feldon, architect:—

J. Sear	£862 10 0
C. Monk	750 0 0
T. Flint	700 0 0
E. Horn	660 0 0
G. Capper	653 0 0
W. Carlin	630 0 0
G. Philbey	500 0 0

For the erection of a pair of semi-detached villas at Hemel Hempstead, Herts. Mr. Walter T. Feldon, architect:—

J. Sear	£1,225 0 0!
C. Monk	1,068 12 0
E. Horn	990 0 0
G. Capper	912 0 0
W. Carlin, St. Alban's (accepted)	785 0 0
G. Philbey	655 0 0!

For the erection of shop-front at Hemel Hempstead. Mr. Walter T. Feldon, architect:—

J. Sear	£350 0 0
W. Carlin, St. Alban's (accepted)	335 10 0

For road and sewer works, on the United Land Company's Elstree Estate:—

Marriott Bros.	£939 0 0
G. Felton	849 0 0
J. Clarke	825 0 0
J. Stockwell	735 0 0
Rowland Bros.	650 0 0
Wilkes & Co. (accepted)	646 0 0

For road and sewer works on the United Land Company's Church-road Estates, No. 2:—

J. Stockwell	£1,055 0 0
J. Pizzey	990 0 0
W. Crockett	985 0 0
W. Harris	929 0 0
Tomes & Wimpey	914 0 0
Rowland Bros.	899 0 0
Neave & Son	868 0 0
Dyer & Huntley	851 15 0
Wilkes & Co.	811 0 0
G. Felton (accepted)	783 0 0

For rebuilding No. 33, Duke-street, Aldgate, for the Trustees of the United Synagogue. Messrs. N. S. Joseph & Pearson, architects:—

Roberts	£775 0 0
Partridge & Henderson	690 0 0
J. Lidstone & Son (accepted)	638 0 0

For the erection of a school to provide accommodation for 1,400 children, in Mansford-street, Bethnal Green, for the School Board for London. Mr. E. R. Robson, architect:—

W. Brass	£15,493	0	0
J. T. Chappell	15,439	0	0
J. F. Sargeant	15,186	0	0
Kirk & Randall	14,996	0	0
Peto Bros.	14,964	0	0
G. S. S. Williams & Son	14,790	0	0
E. Lawrance	14,778	0	0
W. Tongue	14,664	0	0
Wall Bros.	14,633	0	0
J. Grover	14,487	0	0
S. J. Jerrard	14,419	0	0
Higgs & Hill*	14,344	0	0

* Recommended by Works Committee for acceptance.

For the erection of a school to provide accommodation for 1,200 children, in Wood-street, Woolwich, for the School Board for London. Mr. E. R. Robson, architect:—

Peto Bros.	£15,493	0	0
E. Lawrance	14,916	0	0
F. & F. J. Wood	14,884	0	0
J. Grover	14,705	0	0
J. T. Chappell	14,493	0	0
Kirk & Randall	13,668	0	0
W. Tongue*	13,546	0	0

* Recommended by Works Committee for acceptance.

For the enlargement of the Thames-street School, Limehouse, by 480 places, for the School Board for London. Mr. E. R. Robson, architect:—

F. & F. J. Wood	£5,436	0	0
G. S. Prichard	5,299	0	0
E. Lawrance	5,281	0	0
B. E. Nightingale	5,181	0	0
C. Cox	4,931	0	0
Harris & Wardrop	4,930	0	0
S. J. Jerrard	4,850	0	0
Atherton & Latta*	4,800	0	0

* Recommended by Works Committee for acceptance.

For the enlargement of the Park-walk School, Chelsea, by 400 places, for the School Board for London. Mr. E. R. Robson, architect:—

W. Tongue	£3,581	0	0
W. Brass	3,366	0	0
W. Downs	3,247	0	0
Higgs & Hill	3,187	0	0
J. T. Chappell	3,156	0	0
W. Oldrey	3,098	0	0
J. Grover	2,998	0	0
Kirk & Randall	2,810	0	0
C. Wall*	2,720	0	0

* Recommended by Works Committee for acceptance.

For the enlargement of the Gipsy-hill-road School, Lower Norwood, by 400 places, for the School Board for London. Mr. E. R. Robson, architect:—

J. Marsland	£5,186	0	0
S. J. Jerrard	5,116	0	0
Kirk & Randall	5,113	0	0
J. D. Hobson	5,100	0	0
Stimpson & Co.	5,076	0	0
E. Lawrance	5,069	0	0
B. E. Nightingale	5,033	0	0
W. Tongue	5,027	0	0
C. Wall	5,009	0	0
Higgs & Hill*	4,988	0	0
W. Shepherd (withdrawn)	4,064	0	0

* Recommended by Works Committee for acceptance.

For the enlargement of the School in Edinburgh-road, Ladbroke-grove-road, by 400 places, for the School Board for London. Mr. E. R. Robson, architect:—

W. Tongue	£3,218	0	0
J. Rankin	3,149	0	0
Higgs & Hill	3,090	0	0
Wall Bros.	3,090	0	0
W. Oldrey	2,997	0	0
W. Scrivener & Co.	2,905	0	0
J. Grover	2,868	0	0
W. Shepherd	2,808	19	0
Stimpson & Co.*	2,773	0	0

* Recommended by Works Committee for acceptance.

For the Piccadilly Art Galleries, &c. Mr. E. R. Robson, architect. Quantities by Mr. R. Roberts:—

				Additional if Mosaic Pavement.		
Manley	£37,341	0	0	£1,000	0	0
Webster	36,060	0	0	850	0	0
Brass	35,523	0	0	900	0	0
Trollope & Sons	35,240	0	0	920	0	0
McGregor	34,627	0	0	1,210	0	0
Wall Bros.	34,500	0	0	1,180	0	0
Bywaters	34,339	0	0	1,024	0	0
Holland & Hannen	34,362	0	0	870	0	0
Kirk & Randall	34,211	0	0	1,030	0	0
Higgs & Hill	33,840	0	0	1,100	0	0
Chappell	32,560	0	0	1,000	0	0
Peto Bros.	31,539	0	0	1,009	0	0

For sewers and roads on land near the Midland Station, Wellingborough, for Mr. C. J. K. Woolston. Mr. E. Sharman, surveyor:—

	Contract No. 1.			Contract No. 3.		
Maycock, Wellingborough	£743	0	0	£177	0	0
Henson, Kettering	669	0	0	155	0	0
Henson, Wellingborough	638	0	0	145	0	0
Willmot, Rushden	636	0	0	140	0	0
Underwood, Wellingborough*	615	0	0	144	0	0

* Accepted.

For the erection of Congregational Church, with vestries, schoolroom, &c., in Seven Sisters-road, Finsbury-park. Mr. Chas. H. Searle, architect. Quantities supplied:—

Scurrah	£13,119	0	0
Brass	12,000	0	0
Manley	11,939	0	0
Macey & Sons	11,946	0	0
Little	11,583	0	0
Williams & Son	11,580	0	0
Nightingale	11,473	0	0
Patman & Fotheringham	11,283	0	0
Dove Bros.	11,176	0	0
Harris & Wardrop	10,992	0	0
L. H. & R. Roberts	10,294	0	0

TO CORRESPONDENTS.

P. P. P. (shall be published. Send particulars).—M. M. M. (not received).—R. (letter should have been addressed to the Editor, not to the Publisher).—G. G. R. (under our mark).—E. W. H. (apply to the Department. Enclose a P.O. stamp).—J. J. G. (we have mentioned the proposed Exhibition more than once).—C. & G.—G. C. H.—A. W. R.—H. S.—T. D.—E. I.—W. C. C.—E. Y.—H. & Co.—A. E. P. T. R.—J. T. L.—G. T. C.—D. E.—J. S.—J. J. L.—W. J. B.—W. S.—T. P.—T. M.—J. U.—A. G. B.—L. A.—J. H. S.—A. T. S.—W. T. F.

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Is the best for use in all exposed positions, being a well-known and tried weather stone.
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PICTOR & SONS,
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Doulting Freestone and Ham Hill Stone of best quality, in blocks, or prepared ready for fixing. An inspection of the Doulting Quarries is respectfully solicited; and Architects and others are CAUTIONED against inferior stone. Prices, delivered to any part of the United Kingdom, given on application to CHARLES TRASK, Norton-sub-Hamdon, Ilminster, Somerset. — Agent, Mr. E. WILLIAMS, 73, Charlotte-street, Portland-place, W. [Advt.

Doulting Stone and Ham Hill Stone, of best quality. Prices and Estimates, including delivery to any Station, on application to STAPLE & HANN, Quarrymen, Stoke-sub-Hamdon, Ilminster. Agent, Mr. E. CRICKMAY, Langbourn-chambers, 17, Fenchurch-street, E.C. [Advt.

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Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
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Immense quantities of
DRY WAINSCOT,
DRY MAHOGANY,
DRY WALNUT,
in all thicknesses.
B. J. HUDSON & SONS,
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MANUFACTURERS OF
IMPROVED HOT-WATER APPARATUS,
FOR WARMING AND VENTILATING
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Illustrated Pamphlet on "Heating" post free for Twelve Stamps.

F. W. REYNOLDS & CO.
ACORN WORKS,
EDWARD-STREET, BLACKFRIARS-ROAD,
London, S.E.,
HAVE FOR SALE THE FOLLOWING
NEW AND SECOND-HAND MACHINERY,
AT REDUCED PRICES.

ONE 8-H.P. PORTABLE STEAM ENGINE, as good as new. First-rate make, with all improvements. To be sold at a reduction.

ONE 8-H.P. PORTABLE STEAM ENGINE, in use a few months only. In capital condition. To be Sold at a great reduction.

ONE 7-H.P. PORTABLE STEAM ENGINE, quite new. To be sold at a reduction.

ONE 6-H.P. PORTABLE STEAM ENGINE, quite new. To be Sold at a reduced price.

(These Engines are fitted with the Patent Feed Water-heater and the Patent Steam-blast Tube-cleaner.)

ONE 2-H.P. HORIZONTAL ENGINE, with VERTICAL BOILER, combined.

ONE 3-H.P. HORIZONTAL ENGINE, with VERTICAL BOILER, combined.

ONE 3-H.P. HORIZONTAL ENGINE.

ONE 4-H.P. VERTICAL ENGINE.

ONE 8-H.P. VERTICAL BOILER.
This Engine and Boiler have been thoroughly overhauled and put into good Working Order. WILL BE SOLD AT A VERY LOW PRICE.

NEW GAS ENGINE (2-h.p.), Simon's Patent, to be Sold cheap, having no further use for it. This Engine is as good as new, and in thorough Working Order. A BARGAIN.

ONE COMBINED MORTAR-MILL and ENGINE (Portable). Very strong. (See illustration on p. vi.)

ONE MORTAR-MILL, with 6 ft. 6 in. Revolving Pan. Reynolds's "Spécialité," with Timber Bed complete. Second-hand.

ONE MORTAR-MILL, with 7 ft. Pan. Reynolds' "Spécialité," Second-hand, but as good as new. With Timber Bed complete. To be Sold Cheap.

ONE CIRCULAR SAW-BENCH, with rising and falling Spindle, and 30-in. Saw. As good as new.

ONE CIRCULAR SAW-BENCH, for 36-in. Saw, with Self-Acting Feed Motion.

ONE HAND-POWER CROSS-CUT SAW-BENCH (Second-hand), with 18 in. Saw.

ONE PANEL PLANER, to Plane Wood up to 16 in. wide, 30l.

SIX BAND-SAWING MACHINES, for foot or steam power, with 18-in. pulleys, price 10l. 10s. each.

FOUR MORTISING MACHINES, light make, suitable for Blindmakers or Joiners, for fixing to bench, 6l. 6s. each.

SIX do. do. do. on strong pillar stand, 7l. 7s. each.

ONE 9-inch CENTRE SELF-ACTING, SLIDING, SURFACING, and SCREW CUTTING LATHE, with 12-ft. Gap Bed, full Set of Change Wheels, Sliding Stay, and Overhead Motion complete. To be Sold cheap. Inspection invited.

SEVERAL DRILLING MACHINES, various sizes.

ONE TOOL GRINDING MACHINE (with Seven Stones), Trough and Cocks complete, for Plane and Moulding Irons.

ONE 20-TON LIFTING JACK (Haley's Screw Jack), with Wood Case, to be Sold a great Bargain.

BRICKMAKING MACHINERY, quite new, Will be Sold Very Cheap:—
A Double Set of MURRAY'S CRUSHING ROLLERS (Hedgehog and Plain), and
A HORIZONTAL MIXING MILL. These Crushing Rollers and Mixing Mill are offered at a Great Sacrifice.
ONE HAND-POWER BRICK PRESS.
See Advertisement, p. vi.

ABOVE MAY BE SEEN,
Together with a large Collection of Steam and Hand-Power Wood-Working Machinery, "IN OPERATION," at
F. W. REYNOLDS & CO.'S,
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